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ABSTRACT

This training manual is intended to enable educators to utilize the SAGE Tri-Fold Model as a means for developing a process-oriented differentiated curriculum for elementary grade gifted students using either the separate classroom, the resource room, or the consultant teacher model. The program, a nationally validated National Diffusion Network Program, is based on those theories found to be most workable in the areas of identification, program planning, curriculum development, and evaluation. The tri-fold model refers to the three key elements of the curriculum: (1) thinking skills development, covering critical thinking, logical reasoning, creative thinking, creative problem-solving, and research skills; (2) mini-study units for the inclusion of enrichment materials which are broad-based, interdisciplinary, and incorporate thinking skills into content areas; and (3) independent study involving individual or group projects and allowing in-depth study of special interests as well as linking students to mentors. An extensive introduction describes the curriculum, presents its theoretical basis, offers guidelines for student selection and parent/teacher training, and discusses in depth each of the three curriculum components. The major portion of this document consists of about 50 complete mini-study units in the areas of science, literature, social studies, art, and miscellaneous. The units contain objectives, research questions, and activities. Appendices provide nomination forms, giftedness identification forms, information on thinking skills, and curriculum differentiation forms. (Contains a 27-item bibliography.) (DB)

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TEACHER TRAINING
AND
IMPLEMENTATION MANUAL

by
Diane Modest
Sandra Cymerman

EC304284

SAGE
THE SPICE OF LEARNING FOR THE GIFTED & TALENTED

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Diane Modest
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SAGE - A nationally validated National Diffusion Network Program developed by the Framingham Public Schools, Framingham, MA.

"Programs in the National Diffusion Network have been developed by local school districts, institutions of higher education, state departments of education, and private non-profit agencies, and have been examined by the U.S. Department of Education to determine that they are appropriate for dissemination. While the Department has determined that the programs are appropriate for dissemination, no Federal endorsement of content or philosophy should be inferred. Local school districts should use the same procedures for making decisions to install NDN programs as are used to select any other educational materials or instructional approaches."

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Introduction

The focus of our work is to provide a practical guide for educational service providers who wish to adopt the SAGE Program.

We have synthesized and researched what we feel are the most workable theories in the areas of identification, program planning, curriculum development and evaluation for the education of gifted and talented students. The purpose of this introduction is to highlight the key theoretical components that provide a rationale for the SAGE Program.

The U.S. Department of Education's definition of gifted and talented provided a starting point for the program planning of SAGE.

> [1]*The gifted and talented are...children and, whenever applicable, youth who are identified at the pre-school, elementary, or secondary level as possessing demonstrated or potential abilities that give evidence of high performance capability in areas such as intellectual, creative, specific academic or leadership ability or in the performing and visual arts, and who by reason thereof require services or activities not ordinarily provided by the school.*

Framingham's gifted and talented committee conducted a needs assessment which resulted in the decision to focus in upon the areas of intellectual ability, academic aptitude and creative or productive thinking. Two major questions were addressed:

Who are the gifted and talented?

How do you best service these children?

Before the actual administrative models were designed, we compiled information addressing characteristics and identification of the gifted and talented. The material presented in the identification section of the training manual has been adapted from Alexina Baldwin's *Identification Matrix* (Baldwin, 1978), James Gallagher's *Teaching of the Gifted Child* (Gallagher, 1975) and Joseph Renzulli's *Three-Ring Model of Giftedness.* (Renzulli, 1978)

In determining the best way to deliver services to gifted and talented children three administrative strategies were studied. At this time (1978-79) no previous research had been conducted to prove the efficacy of any specific model. Therefore,

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[1] U.S. Congress, Educational Amendment of 1978 P.L. 95-561, IX (A)) in Davis and Rimm, 1985, p 10.

Framingham's Title IV-C pilot program sought to compare and contrast the following three models: separate classroom, resource room and teacher consultant, in order to determine the most effective model to service gifted and talented children. Each model is described in detail in Section I of the training manual. The results of the three-year research study are provided in the SAGE Evaluation Guide.

The development of the SAGE Tri-fold Curriculum was based upon two primary objectives of the program: 1) to develop higher order thinking skills, and 2) to stimulate academic achievement. These objectives are achieved through a three-fold curriculum incorporating thinking skill development, mini-study units, and independent studies.

The theoretical base of each component of the tri-fold curriculum is described in Section II, Theoretical Background of SAGE. In formulating a comprehensive program for the development of higher level thinking skills, research of the work of the following people, Benjamin Bloom, Frank Williams, William Guilford, Joseph Renzulli, Alexander Osborn and Paul Torrance provided a framework. The mini-study component, which provides the content vehicle for developing the thinking skills, is based upon the work of Sandra Kaplan and Irving Sato. The independent study was adapted from Joseph Renzulli's triad, representing level III, the investigation of real problems by individuals or small groups. (Renzulli, 1978)

The procedure to evaluate the three models of service was the non-equivalent control group design. In addition to pre and post testing using standardized measures as described in the manual, a series of questionnaires were designed for school personnel, parents and students. Items were concerned with the program's operational processes (e.g., selection, communication, and benefits to students). Analysis of the three-year study is detailed in the SAGE Evaluation Guide. (Kerlinger, 1973.

Evaluating students who are in the SAGE Program is an on-going process. Three methods employed include the SAGE Progress Report, Scope and Sequence forms, and student self-evaluation. The skills listed in the SAGE Progress Report (Appendix B) reflect the major learning tasks and expectations required of the students. These tasks evolved from the theoretical base of the program as previously discussed. The Scope and Sequence charts were designed to correlate with the tri-fold curriculum. This is a recordkeeping system for concepts learned, thinking processes utilized, and products developed. Theories in program differentiation indicate a need for students to be actively involved in evaluating their work. Judith Wooster, author of *What To Do With The Gifted Few,* claims that program differentiation for gifted and talented includes varying degrees of student involvement in self-evaluation. The evaluative methods suggested include employing the use of criteria by which students can actually rate themselves. (Wooster, 1978)

We expect that educators will utilize this guide not only to gain background in gifted and talented theories and practices, but to develop skills in preparing process-oriented learning activities. Provision of differentiated learning experiences for gifted and talented students is the goal we hope teachers will achieve. This is the most important aspect of a really successful gifted program!

Background of Sage Program Development

A committee was formed as a summer workshop to assess the needs of the gifted and talented students in the Framingham Public Schools. The committee consisted of administrators, teachers at the elementary and middle school levels and a community representative. After researching gifted and talented programs and materials, the group decided to focus on developing a program for academically/ intellectually advanced students in grades 1-5.[1]

Three major models were most often utilized in programs for the gifted: the separate classroom; the resource room; and the consultant teacher model. A research study to determine which model would be most effective for improving the higher level thinking skills for academically/intellectually advanced students in grades 1-5 was designed. Thus, Project SAGE began as a Title IV-C program with a three-year research grant.

An integral part of Project SAGE is the threefold curriculum, which incorporates thinking skill development, mini-study units and independent study. Students participating in the pilot program performed at significantly (.05) higher levels in higher order thinking skills when compared to a non-participating comparison group, as measured by tests of higher level thinking skills (specific evaluation data are available). Six out of nine elementary schools in Framingham were involved the Project SAGE pilot program. Four schools were involved in the experimental group participating in one of the three models. In 1983 Project SAGE was implemented in all nine schools utilizing a combination of two models: resource room and consultant teacher.

SAGE was granted national validation from the Joint Distribution Review Panel in Washington, D.C. in May, 1983. A grant was awarded to SAGE by the National Dissemination Network (U.S. Department of Education) as an exemplary program to be replicated by school systems throughout the United States.

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[1] SAGE currently has J.D.R.P. approval for grades 1-5, but is now implemented in in grades 1-6.

How Can Sage Meet Your Needs?

The SAGE program has been developed with a flexible, yet effective base which can be tailored to the needs of individual school districts. SAGE provides fully developed components for either beginning or augmenting a gifted/talented program. Consideration of what each administrator intends to provide for gifted/talented students in terms of selecting a program model, time allotment, budget for staff and materials, staff training, etc., is addressed in the SAGE Implementation Guide. Technical assistance can be provided by the SAGE staff in all areas of implementation.

The content of the Tri-Fold Curriculum provides a strong base for your gifted and talented program. Administrators and teachers can determine how to adapt this curriculum to best meet the needs of their students. A brief description of the program and its effectiveness follows this section. Specifics and samples for implementation are discussed in the Curriculum section of this manual.

The purpose of this training manual is to enable educators to utilize the SAGE Tri-Fold Model as a means for developing differentiated curriculum for the gifted.

Differentiating the Curriculum for G and T Students

The SAGE Program focus must be considered in terms of **differentiation** vs. **enrichment** and **acceleration**. The definition of these program types can help clarify the major emphasis of the SAGE Program.

Acceleration refers to increasing the speed of the introduction of specific skills, thus causing them to occur sooner than expected. It is common that bright children are capable of quick-paced vertical growth in such curricula areas as mathematics and reading. As students display mastery in given skills, they can be moved on to the next level. Programs of pure acceleration simply require students to recall bodies of information, comprehend the material presented and apply learned facts.

Programs of **enrichment** employ methods that bring about the horizontal growth of students in subject areas. The topics addressed are made richer and are embellished upon, therefore allowing a fuller, more meaningful or more rewarding experience in the study of the content presented at the grade levels. Enrichment can serve as a motivating force for all students and is known to increase productivity among students whether they be gifted or slow learners.

The emphasis of the SAGE Program is neither placed on acceleration nor enrichment. The thrust focuses in upon **differentiation**, a program dependent upon alterations or modifications of teaching/learning styles. While the SAGE Program does incorporate enrichment topics and the use of more complex materials, the distinction lies in the presentation of curriculum in a process-oriented teaching approach. Materials are introduced at higher, more abstract levels of thinking, therefore, we strive to increase the cognitive complexity, not merely the complexity of content.

The curriculum for the gifted must be congruent with the characteristics that identify gifted children. **Differentiation** of curriculum activities must be synonymous with these characteristics. To differentiate curriculum SAGE varies not only the cognitive complexity, but the following areas:

- affective emphasis
- creative emphasis
- the format of presentation
- duration of
  introduction
  direct practice
  directed and independent application
- degree of student involvement in planning
- degree of student involvement in evaluation
- evaluation methods and criteria
- teaching learning materials

These options allow students the opportunity to exercise and apply abstract thinking skills, therefore learning by methods and styles matched to their specific needs. Program activities are devoted to the further development of particular intellectual skills and talents of the gifted child.

> The ability to associate and interrelate concepts.
>
> The ability to evaluate facts and arguments critically.
>
> The ability to create new ideas and originate new lines of thought.
>
> The ability to understand other situations, other times, and other people, to be less bound by one's own peculiar environmental surroundings.
>
> The ability to reason through complex problems.

The primary program adjustment for gifted students is not to give them longer and more extensive assignments of the same sort given to average students. They may or may not absorb an almost unlimited supply of facts or dutifully attack the new assignments and work hard at them. They must realize the opportunity to explore larger and more important ideas (Kaplan, 1974).

Curriculum Overview

Project SAGE core curriculum has been developed and implemented in all three educational models. The core curriculum is three-fold, including thinking skills development, mini-study units and independent study.

Activities presented in the **thinking skills development** portion of the curriculum:

> Stimulate and challenge students to think and to perform at higher levels of thinking.
> Assist in the development of critical, inductive, deductive and creative thinking skills.
> Present specific instruction in areas of information gathering, organizing and using resource materials.

Enrichment materials, provided in the form of **mini-study units**, currently include resources and background information not available through the regular curriculum. Mini-study units, extensions of the basic curriculum, are interdisciplinary in nature, and incorporate thinking skill activities in broad topic areas.

The third segment of the SAGE core curriculum is **independent study**, which allows students to extend and to enrich their knowledge of interest/content areas. Students probe either individually or in small groups, using a variety of discovery, inquiry and exploration techniques. Project SAGE's Parent/Community Involvement Mentorship Program is an outgrowth of independent study. As students identify interests, becoming first-hand inquirers, it becomes necessary to match a child with specialists in the field. By utilizing community resources, students are able to pursue their interests beyond the confines of the classroom with mentors in or perhaps outside of school. Mentors serve as role models and offer intensive real-world experiences. As a result of the mentorship programs, students can develop their interests into "expertise".

All students become involved in the same thinking skills development and independent study programs, whereas mini-study units include approximately fifty broad-based interdisciplinary topics selected by the SAGE staff and classroom teachers as logical extensions of the basic curriculum in areas of student interest.

KEY ELEMENTS OF SAGE CHECKLIST

A population of gifted/talented students has been identified using an approved identification system. Teachers using the program have been trained to use the SAGE Tri-Fold Curriculum.

Thinking Skill Development

____ Teachers ask questions at higher levels, using training manual guidelines or their own questions based on Bloom's Taxonomy or other resource services.

____ Teachers present learning activities that require critical thinking/problem-solving.

____ Teachers present learning activities to stimulate creative thinking. Open-ended tasks allow them to generate alternatives and develop divergent thinking skills.

____ Teachers present lessons that encourage the use of the creative problem-solving process.

____ Students are trained to think about their thinking and to apply these strategies to other examples by analyzing and retracing their steps conducted during problem-solving (metacognition).

____ Subject matter is presented using strategies that allow for the gathering of information from a variety of sources. Example: Presenting an assignment that may require students to label the parts of the heart. Students are asked to "survey the major causes of heart disease and graph your results."

Mini Study Units

____ Teachers differentiate content for the gifted students by presenting broad-based interdisciplinary units (themes) of study.

____ Teachers differentiate the curriculum by varying

the cognitive complexity
the creative emphasis
the affective emphasis
the format of presentation
the teaching/learning materials
the duration of
  introduction
  direct practice
  direct and independent application
  degree of student involvement in planning
  evaluative methods and criteria

____ Teachers use the Sage process to design their own curriculum materials.

Independent Study

____ Students are taught the research skills as outlined in the Sage Training Manual.

____ Students are trained to use the inquiry method to explore topics of interest.

____ Students have the opportunity to develop a unique product based upon their research and identify appropriate audiences for presentation of their new products.

____ Community resources are utilized for mentorships and students have an opportunity to make a connection between basic skills and "real world" experiences.

Contact Person

A designated representative (administrator, gifted/talented coordinator or teacher, etc.) from the local educational agency maintains contact with the SAGE office to provide monitoring and feedback information.

Administrative support. Adequate release time is provided for in-service and planning.

Evaluation. Provide information regarding the impact of the program on the students (data on thinking skill development).

Key Curriculum Components

Thinking Skill Development

- Critical Thinking
- Logical Reasoning
- Creative Thinking
- Creative Problem-Solving
- Research Skills

Mini-Study Units

- Broad-based
- Interdisciplinary
- Incorporate thinking skills in content areas
- Application of thinking skills

Independent Study

- Individual or group projects
- Related to an area of student interest
- Allows students to pursue a subject in-depth
- Links students to experts in related fields (mentors)
- Utilizes a variety of discovery, inquiry and exploration techniques

WHO ARE THE GIFTED AND TALENTED?

Perhaps the most debatable local decision-making area of the gifted and talented programs is in the definition of gifted and talented.

Who are the gifted and talented? Some say they are the top 2% of the population, the top 5%, the top 10%; those having I.Q.'s over 140, over 135, over 130, over 120; those scoring in the top 5% on achievement tests and tests on creativity...and so on. The definitions are as varied as the educational programs serving them.

Prior to the development of the SAGE project, many definitions and characteristics were reviewed. Like most programs, SAGE eventually ended up with a multiple characteristic definition, with the strongest emphasis on intellectual and academic abilities.

There are many characteristics and traits that are evident in academically/intellectually gifted and talented children. Most important in examining any list of characteristics is the realization that few gifted children will display all characteristics.

The list of characteristics which follow are provided to give you a better understanding of what giftedness and talent are all about. The following sections are criteria used by the SAGE Program in Framingham.

Traits Common to Intellectually Gifted Children

Displays a great curiosity about objects, situations or events. Has the capacity to look into things and be puzzled; gets involved with many exploratory-type activities; is interested in a wide range of things.

Is a self-initiated student, usually needing little help in knowing what to do; starts on his own; pursues individual interests and seeks own direction.

Exhibits originality in oral and written expression. Consistently gives unusual, clever, unique responses or ideas away from the cliche or stereotype.

Versatility and virtuosity; diversity of interests and abilities; many hobbies; proficiency in art forms such as music and drawing.

Functions at high cognitive levels (as described by Plaget) earlier than the generality; develops basic learning skills earlier.

Has the ability to generate many alternatives. Seeks many directions and is flexible in thinking by going at right angles to the mainstream of thought in the classroom.

Is perceptually open to his environment. Uses all of his senses to be aware of things around him; keenly observant; alert to things that are done as well as things that are not done.

Displays a willingness for complexity. Thrives on problem situations; selects a more difficult response, solution, or problem over the easier; seeks complex asymmetrical forms compared to symmetrical forms; has a preference for "digging into" things.

Has the capacity to use knowledge and information other than to memorize, store and recall. Seeks new associations among items of information; combines elements or materials or knowledge in a unique fashion.

Shows superior judgment in evaluating things. Reasons things out; seeks logical answers; can see implications and consequences; makes decisions easily.

Is a good elaborator. Produces a variety of detailed steps; continually adds on to ideas, responses or solutions; loves to embellish materials and ideas.

Is a good guesser. Is able to hypothesize; is full of wonder about things; is a risk taker; makes good educated guesses.

Learns rapidly, easily and efficiently.

Has the ability to see relationships among unrelated facts, information or concepts.

Uses a lot of common sense; seeks the most practical approach.

Retains and uses information which has been heard or read.

Uses a large number of words easily and accurately.

Asks many questions of a provocative nature; inquisitive about knowing why instead of what; has the capacity to inquire.

Are often socially, emotionally and physically more advanced than their average counterpart.

Due to their differences, they can become anxious about their relationships with their peers and haven't lived long enough to resolve the resultant conflicts.

May possess highly underdeveloped potential that needs to be stimulated.

Profile of Gifted and Talented Youth

The gifted child usually exhibits superior facility for:

LANGUAGE

highly verbal

advanced vocabulary

reads several years above grade level

superior communication skills

creative manipulation of language

CONCEPTUALIZATION

keen insight into cause and effect relationships

highly observant

rapid mastery of and easy recall of facts

creative manipulation of symbols

SOCIALIZATION

outgoing and friendly
assumes leadership roles
well-organized sense of humor
openness to others

PRODUCTIVITY

high physical and intellectual energy level
self-motivated to learn
high standards and goals
prolonged attention span

Sometimes the gifted child is:

Rowdy.
Non-conformist.
Thought of as a behavior problem with very little future potential.
Negative to a dull classroom situation.
Unable to allow himself to reach a mediocre or less than first-rate performance.
Unwilling to attempt a response.
Rebellious and withdraws from the situation.

The Student Selection Process

The Framingham gifted & talented committee conducted an extensive review of literature and research in this area and developed a multiplicity of means of identifying gifted students. They recommended that identification of the gifted should be accomplished by using a multi-criteria approach as follows:

Parent recommendation/Teacher recommendation

Achievement tests

Individual I.Q. tests (130 and above) or Group Cognitive Testing, i.e. Test of Cognitive Skills

Case study - anecdotal record kept by teachers involved with the prospective member of the program

The training of teaching staff and parents in the selection of students is of primary importance. It is necessary to review characteristics, needs, and program goals in order for them to fully comprehend the type of child to be serviced.

A program known to provide enrichment services is viewed by parents and teachers as a program that would benefit a large number of children. Therefore, it becomes most difficult for them to understand the difference between bright children and those who are gifted and talented. What is crucial is the understanding that the program offered provides a differentiated program concentrating on higher cognitive abilities and critical thinking skills, not merely a program providing more to do at more complex content levels.

Training of both parents and teaching staff begins with meetings to review the information packets which are in the appendix. Since both parents and teachers have equal opportunities to nominate students, complete knowledge of the procedures are included in the packets along with forms to be filled out. Both packets include a list of characteristics generally observed in gifted children and the nine steps of the SAGE selection process. The parent packet also includes a questionnaire while the teacher packet includes a Teacher Nomination form and a copy of the Renzulli Hartman rating scale.

Step I - Teacher/Parent Training

Step II - Nominating Criteria

Any child, scoring a composite score in the 97th percentile or above on the SRA Achievement tests shall be included in the initial screening.

Any child, who functions at a consistently high academic level as judged by his/her teachers, may be nominated as a potential candidate for this program.

Teachers, principals, guidance counselors and administrators may nominate pupils who exhibit the potential for developing academically, but who have not scored well on achievement tests or overall academic functioning. Students who are bilingual, or members of a minority group, should be given particular attention for their achievement scores and grades are not always indicative of their ability or giftedness.

Nominations will also be accepted from parents.

In addition to parent/teacher nomination, all students are reviewed for their achievement testing results. Those students scoring 97 percentile to the 99 percentile nationally, are included in the screening pool and deserve further consideration. Systems may determine their own percentile based upon population.

Step III

All nominated students are further considered in the areas of learning, motivation and creativity. The Renzulli-Hartman Behavioral Rating Scale, completed by classroom teachers, focuses in upon the frequency to which the listed behaviors, characteristic to gifted and talented, occur. The SAGE criterion acceptance score on the Renzulli-Hartman is 29. Since there is a degree of subjectivity to this measure, teacher training is recommended. Each listed behavior should be reviewed and observable examples shared. A copy of the Renzulli-Hartman Behavioral Rating Scale is included in the teacher packet in Appendix A.

Step IV

Existing test information and all pertinent data of students nominated will be collected and reviewed.

Step V

The Test of Cognitive Ability is then administered to all children. We have administered the test as follows:

Level 1 - Grades K and 1

Level 2 - Grades 2 and 3

Level 3 - Grades 4 and 5

Level 4 - Grade 6

Student-expected outcomes for our target population is approximately 130 (Intelligence Quotient). Other tests which give an indication of a student's intelligence quotient may be used.

Step VI

Participating in the screening process will be principals, school support personnel, Project SAGE teachers and the director of Project SAGE. The data listed above will be reviewed carefully and the children most qualified for the program will be selected for further testing.

Students not meeting criteria may be dropped from the screening at this time. This is determined by a team consisting of principals, school support personnel, teachers of gifted and talented, etc. Letters of notification should be sent to parents sharing the testing results.

Step VII

A writing sample is obtained from each student, grades 1-4. Interviews will be conducted with K students. The SAGE criterion acceptance score on the writing sample is 3.0. A copy of materials with complete directions for administering and scoring both the writing sample and the interview are included in Appendix B.

Step VIII

Any student requiring additional data will participate in a creative thinking assessment. This will be available to adopting school districts by written request.

Step IX

The final step in screening will be the selection of children, using all relevant data. The data will be recorded on a matrix (see Appendix) with each category weighted as described.

After all information is gathered, results are entered on the matrix. The matrix provides a visual representation of results which also provides a weighting from 1-5. Weightings are totaled and indicate the strongest candidates. Final determination is made for entrance into the program by the screening team.

Letters of notification also follow, providing a full packet listing testing results and explaining measures employed. These letters are included in Appendix.

Step X

Parental approval will be obtained. (Sample form included in Appendix. A)

Summary Checklist

____ Train parents and teachers.

____ Distribute teacher/parent packets.

____ Review achievement tests to pull student (names) scoring 97 - 99 percentile (or desired percentile).

____ Create list of names for screening pool.

____ Distribute Renzulli-Hartman scales to be filled out by teachers.

____ Score rating scales.

____ Administer Test of Cognitive Skills.

____ Inform parents of students not meeting criteria thus far.

____ Administer writing sample and/or interview.

____ Complete program cover sheets.

____ Conduct screening team meetings to review final results and determine student selection.

____ Notify parents and obtain parental approval.

SELECTING A PROGRAM IMPLEMENTATION MODEL

A number of alternative structure models have been attempted with gifted and talented programs. There is not necessarily a "right" or "wrong" model to implement as each model has advantages and disadvantages. The selection of an appropriate model is, however, critically tied to a particular school's facilities, personnel, material resources, philosophy, and population.

The SAGE project implemented four basic models in different settings during the program development. It should be noted that in the evaluation of these various models there were no significant differences in student outcomes between the models.

The following is a brief description of each model and some questions that should be answered in selecting the most appropriate.

Separate Classroom Model

The separate classroom model in the pilot program involved students from two elementary schools and consisted of two classrooms. One school housed a class of students in grades 1-3 and the other school housed students in grades 4-5. The students received all academic instruction in the separate class, together with enrichment and expansion of the curriculum beyond that of the regular classroom.

Implementation Requirements

Staff : Teachers trained to teach a homogeneous group of academically gifted students.

Classroom Space: A regular classroom for each separate class. Students may be from one grade level or grade levels can be combined.

Financial Consideration: Salary for teachers on the regular salary scale. Money for materials in addition to those regularly provided by the school.

Questions to Consider: What are the ramifications of having the most academically advanced students together in one class: for the teacher? for the student? for other teachers of the grade level? for the other students not in the program? for the school community? Are there enough students who qualify for the program to compose an entire class?

In a separate classroom model the students have the opportunity to move through the regular curriculum and extended areas of study at a faster rate. However, the issue of separating those students from their peers of differing abilities needs to be considered in regard to the school/community's philosophy.

Resource Room Model

This model in the pilot program was a "pull-out" program where students visited a central enrichment facility for approximately six to seven hours per week. A trained SAGE staff member provided differentiated instruction based upon the project core curriculum. Service may be provided in either a full-day pull-out program or spread over several sessions during the week.

Implementation Requirements

Staff: At least one teacher trained to use the SAGE program. The G/T teacher may service more than one school.

Classroom Space: Space (ideally a classroom) is needed to house the resource room. A combination of grade levels may be together in the resource room.

Financial Considerations: Salary for a G/T resource teacher. Money for materials in addition to those regularly provided by the school.

Questions to Consider: What will be the effects of having the child leave the regular classroom: on the child; the classroom teacher; the other children? Will the classroom teacher compact the curriculum? Will there be a correlation between the regular classroom and the resource room? Will there be adequate space? What scheduling difficulties might arise? How much time will the G/T teacher have with each student to successfully implement SAGE?

Consultant Teacher Model

During the pilot program students in grades 1-5 remained in the regular classroom. The consultant teacher (also the project director) offered educational programming assistance to fifteen regular classroom teachers, aiding in compacting of the basic curriculum for gifted students in order to provide opportunities to implement SAGE program activities in the regular classroom. Consultation meetings were held with the teachers, both individually and in small groups, to discuss student needs, teaching strategies and available materials for teaching the identified students in their regular classrooms. Students in this model received differentiated programming for approximately four to six hours weekly.

A trained classroom teacher can implement this program in his or her classroom. The consultant teacher could also be another staff person, either full or part time, as designated by the administration. Such personnel could be reading specialists, librarians, or other individuals trained in the SAGE process. The role of the consultant teacher is to initiate SAGE activities in the classroom and provide materials for the regular classroom teacher.

Implementation Requirements

Staff: At least one person trained in the SAGE program to serve as a coordinator.

Classroom Space: A place within the regular classroom where the students can work in the SAGE program on a regular basis. Space within the building to house SAGE materials.

Financial Considerations: Salary for a G/T teacher/ coordinator. Note: If a staff member coordinates the program in addition to regularly assigned duties, a stipend should be provided. Money for materials in addition to those regularly provided by the school.

Questions to Consider: Will the regular classroom teacher and consultant teacher have adequate planning time? How will the gifted students and the regular students be coordinated while SAGE is taught in the regular classroom? What scheduling problems might arise? What effects will this model have on the regular classroom teacher? the identified gifted students? the regular classroom students? scheduling for the consultant teacher? scheduling for the regular classroom teacher? Will the consultant teacher be able to provide in-service training for the staff?

Consultant/Resource Model

This combination model was implemented on a town-wide basis in Framingham in 1983. The identified SAGE students receive direct services provided by a trained teacher. These services are provided in a resource facility for a specified period of time each week. Extension of the basic curriculum is then made within the regular classroom. The SAGE teacher provides assistance to the regular classroom teacher through the integration of the differentiated curriculum into the regular classroom. The SAGE teacher is available to go into the regular classroom, conduct demonstration lessons in any of the thinking skill areas, provide resources, and set up activity centers.

Implementation Requirements

Staff: A teacher trained in the SAGE program who will service 1-2 schools.

Classroom Space: Adequate space within the building to serve as the resource facility.

Financial Considerations: Salary for a G/T resource teacher who will also serve as a consultant for the classroom teachers. Money for materials in addition to those regularly provided by the school.

Questions to Consider: How will leaving the regular classroom affect: the identified gifted student: the other children in the classroom: the classroom teacher? Will the classroom teacher be willing to compact the regular curriculum for the gifted students? Will the classroom teacher be receptive to the G/T teacher presenting integration/demonstration lessons? Will the classroom teacher have time to utilize SAGE materials within the regular classroom? How will planning in-service time be allotted for the successful implementation of this model? What scheduling difficulties might arise? How much time will each identified gifted student spend in the resource room each week? Will it be one large block of time or in smaller time periods?

The checklist on page 26 has been provided to assist you in making selections regarding the management model and the time allotment for the program. The last section is to assist in determining the program costs.

Model Selection Checklist

Based upon the needs of your system, it is necessary to determine the management model to be implemented.

____ Separate classroom

____ Resource Room

____ Consultant Teacher

____ Other/Combination ______________________________

The time allotment per week for student participation must also be determined.

Resource time ______________________________

Class time (separate/consultant) ______________________________

Other/combination ______________________________

Depending upon the size of the school district and the model selected, the following should be considered:

Will students be housed in a central facility?

Will students remain in their individual school?

Will grades be combined in any of the management models?

The budget can be considered on a per-pupil basis. Costs to be considered:

Total cost of program

Per-pupil cost

Staff costs (salary and inservice)

Supply costs

PROGRAM PERSONNEL

Once the management model has been selected, the specific instructional staff can be identified. In order to determine the number of positions needed, the following questions are to be considered:

Do new jobs need to be created?

Can the job be filled by in-house personnel?

Who will coordinate the program?

Who will assume the responsibility of *contact person* for the SAGE adoption?

How will the gifted/talented staff time be allotted per week?

Will staff be itinerant teachers traveling to schools?

Will students remain at individual schools or will they be transported to a central facility?

In developing a new staff position for a Gifted and Talented Program, a job description clearly delineating specific responsibilities needs to be created. Depending upon the management model selected, specific times and responsibilities regarding the identification of students, teaching, curriculum development, planning, etc., need to be decided.

It is important to determine whether the position is listed as a classroom teaching position or as an administrative position. The salary schedule and educational requirements in regards to a Gifted/ Talented position also need to be determined.

Other factors to consider prior to implementing a Gifted/Talented Program include the following:

Who are the key personnel that will be working with the gifted/talented teachers? In addition to the regular instructional staff, what administrative and support services are available? How will the gifted/talented staff be integrated with the regular staff? (i.e., Will they assume specific duties, such as bus, lunchroom? Will they be required to attend staff meetings, etc.?)

Once staff and budgetary decisions have been made, a time line for program implementation can be developed, and the identification of students can begin.

If budgetary considerations do not allow for the hiring of additional specialized staff for the gifted/talented program, personnel within the system can be trained to implement the SAGE program. Examples follow:

The CLASSROOM TEACHER can be trained to implement the SAGE curriculum in his/her own classroom. One of the teachers or administrators in the system does need to be designated as a coordinator to disseminate materials to the staff.

The READING SPECIALIST or a library or media specialist can be trained to implement the SAGE program and can work with children in a resource room setting or as a consultant teacher providing material for the regular classroom teacher.

The following staffing options for each model are suggested as possibilities. Others may be determined by the individual school system.

SEPARATE CLASSROOM: Full-time teacher of homogeneously grouped class. This can be a regular classroom teacher who has been trained to implement the SAGE curriculum.

RESOURCE ROOM: Full-time gifted/talented teacher assigned to one or two schools. Part-time gifted/talented teacher trained to implement SAGE curriculum.

READING SPECIALIST OR LIBRARY PERSONNEL: trained to implement the SAGE curriculum.

CONSULTANT TEACHER: Full-time gifted/talented teacher. Part-time gifted/talented teacher trained to implement SAGE curriculum. Regular classroom teacher trained to implement the SAGE curriculum.

In addition, when first implementing the SAGE program in any of the management models, it is necessary to identify which classroom teachers will be directly involved in the program and how students will be assigned to teachers. It is more effective to have at least two identified students in a classroom.

Another option for implementation is to begin a pilot program focusing on particular grade levels with plans for expansion in the following year.

SAGE - A PROCESS-ORIENTED CURRICULUM

The SAGE curriculum places emphasis upon the development of thinking skills and processes rather than the mere acquisition of information. What is meant when we consider our focus to be process-oriented? Process refers to the methods of thinking which are emphasized. Thinking skills, introduced in the program, can be classified according to the teaching/learning strategies of problem-solving, creativity, inquiry, and higher levels of cognitive operation. Each strategy incorporates specific skills and operations which are taught and practiced. These skills, however, are not isolated in their application from content. Therefore, the learning activities are related to a body of knowledge (CONTENT) from which thinking and doing can be initiated.

Thinking skills (PROCESSES) presented in the SAGE Program are, therefore, often a higher priority than the content of a subject. The teaching/learning strategies developed within the SAGE Program can be further explained as follows.

INQUIRY
observing
experimenting
critically analyzing
evaluating

CREATIVITY
producing many responses
producing varied responses
producing new or original responses
elaborating on a response

PROBLEM-SOLVING
defining the problem
locating evidence
hypothesizing
validating

HIGHER COGNITIVE OPERATIONS
analyzing
synthesizing
evaluating
evaluating

In addition to the integration of subject and process in the SAGE curriculum, the curriculum is also characterized by its **open-ended** application in which learning activities allow for varied and personalized responses. The curriculum is also **doing-centered**, focusing on tasks which produce active involvement from the learner. Finally, the SAGE curriculum is **student-selected**, providing options for individual differences in need, preference, and capabilities.

Instructional materials which stress the use of verbs that characterize the higher levels of thinking are most appropriate for the academically/intellectually gifted and talented. This process ensures the possibility of teaching of the most abstract and important ideas. The following formula is used in the preparation of these activities.

Content* + *Process* + *Product* = *Learning Activity

EXAMPLE:

After collecting and studying bones (**content**), design a new plus animal skeletal system (**process**)

PLUS: By making a model using bones from various sources (**product**)

EQUALS: Design a new skeletal system for an animal using the bones you've collected for your study (**learning activity**).

The aforementioned formula has been successful in ensuring activities to meet students' needs. Try this formula on your own in creating activities at school/home.

PUTTING THEORIES INTO PRACTICE

The thinking skills development portion of SAGE's Tri-fold Curriculum employs a process-oriented teaching approach where verbal clues and teaching strategies provided by Bloom's Taxonomy, William's Cube and Guilford's Structure of the Intellect enable students to analyze, synthesize, and evaluate. Primary emphasis is on these three higher levels of thinking.

Bloom's Taxonomy

Analysis

attributes
analogies
cause and effect
skills of search
paradox

Logic and Reasoning

inductive vs. deductive
making inferences
tolerance for ambiguity
discrepancies

Evaluation

generating alternatives
determining a solution
deciding possibilities by
consequences and implications
evaluation
developing an action plan

Synthesis

divergent thinking
fluency
flexibility
originality
elaboration

The following section will familiarize teachers with the terminology of these theories and its importance as it applies to the development of curriculum for the gifted and talented student. With this theoretical base teachers will be better able to change the quality and quantity of the content areas by raising the levels of the thinking processes.

*These thinking skills are also found in the Model for Implementing Cognitive-Affective Behaviors in the Classroom developed by Frank Williams. This is another theoretical base employed by SAGE in the development of higher level thinking skills.

Bloom's Taxonomy for Gifted and Talented Students

While gifted curriculum usually emphasized the upper three levels of Bloom's Taxonomy (Analysis, Synthesis, Evaluation), the entire cognitive domain of the taxonomy should be considered in the context of gifted curriculum. Activities in this section will focus upon the upper three levels of the taxonomy.

> *Analysis* - Requires the student to break down the information into parts.
>
> *Synthesis* - The pupil is expected to engage in creative thinking and produce something unique, different and original, putting together constituent elements or parts to form a whole.
>
> *Evaluation* - The pupil is expected to arrive at a good or preferred solution to problems. Judgments are made according to evidence and/or standards. Conclusions are logical in nature.

Bloom's Taxonomy presents a hierarchy of learning which recognizes that different skills are required of different levels of thinking, and indicates a means of advancing students along a continuum of cognitive behavior.

Classroom Emphasis: Implication and Application

The emphasis for using the taxonomy is on adapting it to curriculum and the teaching process to focus particular attention on the categories related to abstract concepts and creative and critical thinking.

Two exercises are provided to allow an opportunity to apply an understanding of Bloom's Taxonomy by:

1. identifying the correct level of the Taxonomy in *Goldilocks and the Three Bears,* and
2. creating an activity for each cognitive level using *Mary Had A Little Lamb* for content.

The phrase "higher-level thinking skills" refers to the top three levels of Bloom's Taxonomy, more formally known as the Taxonomy of Educational Objectives: Cognitive Domain (Bloom, 1974). "Bloom's Taxonomy" draws attention to the distinction between lower-level academic knowledge and higher-level thinking skills, less frequently addressed. It is the higher-level thinking skills that set appropriate objectives for gifted and talented students. While the various levels of thinking are important for all children, gifted students need to go further and apply, analyze, synthesize and evaluate rules, principles or theories.

Bloom's Taxonomy is an excellent guide for the development of questioning techniques and learning activities for the gifted. This section is devoted to the introduction of Bloom's cognitive levels of thinking, their definition and application for the generation of student activities. By using the process verbs, together with appropriate products, exciting learning experiences will evolve, concentrating on the higher end of Bloom's continuum.

Analysis

Among the "higher level" thinking skills, analysis is the most commonly used in classrooms, although students may never know it. As a consequence, half the value of analytic thinking is lost. How often, for instance, did a math teacher ask you to retrace the thinking processes you used to solve a complex problem? When did a science teacher point out to you that the questions on the scientific process were designed to give you a patterned way to think about scientific issues? At what time did your reading or language arts teacher help you label the critical thinking processes and give you opportunity to specifically apply those skills to new tasks?

For most, the answers to these questions are strongly negative. Because teachers themselves are usually not formally trained in thinking skills, they cannot easily teach the skills of thinking to their own students. Instead, they repeat the same errors they were taught; in this case, using analytical skills without knowing it and without benefiting from them

There are several guidelines that become important to review in preparation for addressing the analytic skills.

- Student skill development is enhanced when we make explicit that the skill development is an objective. Most students play the never-ending guessing game of trying to figure out what teacher wants. For the most part, they have learned that the teacher wants students to listen passively. In this context, it is no wonder that students, when asked to analyze, sink deeper into silence. "Tell us, don't ask us." To counter this habit, the effective teacher will use all the basic tools to give clear explicit directions, focus attention and expect clear thinking from all.
- Student skill development is enhanced when feedback methods that encourage students to take risks in how they respond are utilized. Wait time, silence after a response, body language, clarifying and extending questions create a stress-free environment in which the exploration of ideas is valued.
- Student skill development is provided when we take the time to develop the skills. Research concerned with time on task tells us how basic skills are enhanced as we allow more time for a skill. Likewise, if we value analytic

thinking we will not only allot the time, but we will instruct so there is a high mental engagement and successful task completion.

- Student skill development is enhanced when we provide concrete experiences that lead to abstract thought are provided. Much work is currently being done with metacognition, most simply defined as "thinking about thinking." Educators such as Arthur Whimby in his book *Comprehension And Problem Solving* (Whimby, 1982) encourages students to analyze their thinking processes. One technique provides that a student verbally outline each step of his/her process as a problem is being solved. A partner is designated as listener/coach. Once the problem has been solved, the roles are reversed and a new problem is presented. At the conclusion of the second problem, both students analyze their thinking processes and the roles they have experienced.

To promote analytic thinking the following elements should be present in lessons/activities.

A stated objective which emphasized specific thinking skills.

Activities begin with structured group experiences and proceed to the analysis and application of what was learned.

The teacher facilitates analysis; he/she does not **do** analysis for the students.

Time is required. Use it well.

Practice your essential questioning skills to communicate your valuing of student thinking.

Promoting the skill of analysis is a major focus of the SAGE Program. Throughout the curriculum students are required to break apart information into workable components to solve complex problems, question issues and retrace strategies. A sample of activities utilized by the SAGE Program to promote analysis follows.

Activities to Develop the Skill of Analysis

Sample from Cultural Analysis

Suppose you were a businessman trying to clinch a deal with someone from another country. What types of things might be helpful to you to know before you start negotiating?

Choose one holiday and discuss its particular symbols, rituals and traditions. Use your imagination and present possible reasons each one of these rituals developed.

Pretend that you are an anthropologist from another galaxy. You have landed on Earth and somehow wandered into the classroom you usually attend as a student. Observe and record the traditions, rituals and symbols used by teachers and students.

Sample from Dinosaurs

Compare dinosaurs to modern animals. How are they alike? How are they different?

Sample from Economics

Investigate the effect inflation has on farmers.

Every country has its own unit of money. Find out what the current value of the dollar is in various countries and explain how it has influenced the economy of that country as well as our own.

Sample from Keep On Pumping (A study of the the heart)

In a certain hospital, the positions of cardiologist, hemotologist and surgeon are held by Patterson, Saino, and Turner, though not necessarily in that order.
The surgeon, who was an only child, earns the least.
Turner, who married Patterson's sister, earns more than the hemotologist.
What Position Does Each Doctor Hold?

Sample from Beatrix Potter

Pretend a time machine has taken you back to Beatrix Potter's time.
Analyze what life was like then.

Synthesis

When students are being challenged to develop the skill of synthesis, it goes without saying that teachers will have freed all students from classroom practices that inhibit or restrict creative thinking. Obviously, the first step to promoting the skill of synthesis is for each teacher to ask those questions which expect youngsters to predict, hypothesize, design and compose new looks and new solutions. Ultimately, students will engage in lessons designed to produce new insights, new discoveries and new learnings.

The chart below highlights some characteristics which help and hinder students to develop the skill of synthesis.

Help	**Hinder**
Encouraging inventiveness	Encouraging imitation
Rewarding fresh insights	Rewarding standardization
Reinforcing initiative	Reinforcing routine
Praising experimentation	Praising conformity

Recognized authorities on the creative process are deeply concerned that the national supply of talents and abilities be kept ample for the sake of the country's future in the sciences, mathematics, and the arts. That such a supply not be dissipated these leaders are looking to the school as the pivotal public agency for assuring the country's future in terms of creative thinkers and doers. (Gowan, et al. 1981)

The activities that follow are examples of the ways in which SAGE works to stimulate the development of the skill of synthesis.

Activities to Develop the Skill of Synthesis

Sample from Animal Behavior - Modifying Animals

Whoever said that animals have the characteristics suitable for surviving in the environment? Choose an animal you feel should be redesigned. What changes should be made? Reconstruct this animal using materials found in the art center. Be creative! Use your imagination! Your newly formed animal should have a name. You might write a short story, telling where your animal lives, what he does, what he eats.

Sample from Economics

Create a political cartoon on inflation.

Sample from Keep On Pumping (A Study of the heart)

Look at the following cells, including "cardi" and its word derivatives. After the words below are defined and discussed choose one to illustrate, creating a cartoon to present the word in a new and unusual way.

ology . . . . the study of. . . .
meter. . . . to measure. . . . .
gram. . . . . to write. . . . . .
cardi. . . . . heart. . . . .
graph. . . . to write . . . .

cardiomyopathy
cardiod
cardiology
cardiotachometer
cardiotonic
cardiopathy
carditis
cardiovascula
cardiograph
cardiography
cardiorespiratory
cardiologist
electrocardiograph
myocardium
cardiac

Sample from Beatrix Potter

Plan an advertising campaign to sell Beatrix Potter books.
Create a board game based on Beatrix Potter's characters.
Think of an animal that Beatrix Potter never wrote about and write a story. The Tale of ________________________.

Evaluation

Can students evaluate their own performance? The research is sketchy, but one idea is clear; the most difficult of the skills for thinking is the least practiced. Without practice, students cannot hope to evaluate their performance in or out of school.

The thinking skill of evaluation is often confused with the teacher's responsibility to grade student performance. Certainly, student self-evaluation is a good means to help students learn how to measure, critique, justify, and draw conclusions. It is not the only means!

Students can exercise the skill of evaluation a number of ways. Debating is an activity that allows students the opportunity to formulate an opinion and develop criteria to rate convincing arguments. Creative Problem-Solving requires students to rank order solutions in order to determine the best solution to place into practice. Any activity should enable students to:

- Identify evaluative criteria,
- Set priorities according to a standard,
- Rate themselves in accordance to a standard of performance, and
- Use open-ended questions to examine performance against expectations. (Treffinger, 1975)

Activities to Develop the Skill of Evaluation from SAGE Mini-Study Units

A Sample from Economics

Critique government spending in an editorial.
Organize a debate with students taking opposite positions on fighting inflation.

A Sample from Keep On Pumping (A Study of the Heart)

This activity was developed for Sage Training Workshops to demonstrate several components of the Creative Problem-Solving process and formal brainstorming as utilized in Quality Circles. Students work in small groups.

Your team has been assigned the task of designing an early warning system for people with mechanical hearts. For example, your finger nails may turn purple, indicating the need for assistance. The person with the largest shoe size is the **recorder**. The person to his/her left is the **time keeper** (minimum: 10 minutes). The person to his/her right is the **starting point**. Each person responds in turn and each person always has the option to pass. The recorder writes down the ideas. At the end of the designated time ask for a fluency check - a total of the number of ideas. Each group is then asked to select their best idea which may be a combination of attributes from other ideas. Ask each group to describe what criteria was used to select the best idea.

Optional:

That's A Good Idea Because....

This positive feedback technique may be built into this activity. After each person gives an idea the person on their right response with "That's A Good Idea Because..." and provides positive response. The person who presented the idea says, "Thank You." and the response... positive feedback... thank you format continues.

A Sample From Beatrix Potter

Judge which of Beatrix Potter's books is most popular.

Develop criteria to rate her books.

Conduct a survey among your friends.

Have your friends rate the books based on the criteria developed.

Application of Bloom's Taxonomy

UNIT: SURVIVAL

KNOWLEDGE: **List** as many extinct species as you can.

COMPREHENSION: **Develop** a folder, slide show or portfolio that depicts reasons for animal extinction.

APPLICATION: **Apply** your knowledge of extinction to show the ways man must adapt in order to avoid extinction. (model, mobile, or poster)

ANALYSIS: **Identify** the species you feel would dominate if man became extinct and explain the reasons for your choice.

SYNTHESIS: **Compose** a page in a diary that expresses the thoughts that the last human on earth might have.

EVALUATION: **Assess** man's chances for remaining on earth and justify why you think he will not become extinct.

Sample Questions About Ancient Egypt: More of Bloom's Taxonomy

Knowledge

Spell-hieroglyphics, pharaohs, papyrus, sacrophagus, Sphinx.
List 5 important gods and their functions.
Match the words in Column A to their meanings in Column B.
Who was Nefertiti?
Exactly where were the pyramids built?
How many pyramids were built?
Tell the steps in making papyrus.
What is the meaning of the word pharaoh?
Memorize 10 hieroglyphic symbols.
Find the names of 5 important kings.
When was each major pyramid built?
Summarize the main points of Egyptian religion.

Comprehension

Explain why the pyramids were built.
Retell the story of Queen Hatshepsut and the expedition to Put in your own words.
Show your understanding of the role of the gods in Egyptian religion by describing a temple ceremony.
Outline the steps in building a pyramid.
Define the causes of the decline of the glory of Egypt.
Retell the building of a pyramid from the viewpoint of a laborer.
Spell out the reasons why Egyptian civilization rose along the Nile.
Offer three ways in which the stones for the pyramids could have been brought to the desert site.
RE-design the Sphinx by combining it with other animals; give reasons for your choices.

Application

Make use of your knowledge of Egyptian arts and crafts to design a piece of jewelry for a King.
Record the ways in which Egyptian artifacts have been preserved and passed on to us.
Construct a model of a tomb.
Select several pharaohs who interest you. Write an interview with two.
Demonstrate your factual knowledge about mummies by making a chart showing the steps of mummification.
Put together a list of Egyptian farming methods, tools, crops.

Utilize your information about hieroglyphics to write a story using them to replace words.

Analyze

Put the gods and their functions into categories.
Classify the types of Egyptian crafts with examples of each.
Contrast the building of Upper and Lower Egypt.
Examine the effects of the building of the pyramids on the life of the everyday Egyptian.
Survey the various roles of Ra.
Dissect the working mechanism of a shaduf.
Simplify the steps of mummification to the very basics.
Categorize the building materials of the Egyptians. Why did they use these?

Synthesize

Invent a new god. Design a statue for it.
Create a "better" pyramid.
Discuss ways in which life could have been improved for the peasants.
Compare the life of a pharaoh to that of a peasant.
Compose a hymn of praise to a god.
Suppose you were a pharaoh. Tell how you would rule.
Invent a cooling system for the pharaoh's palace using only materials then avail able to the Egyptians.
Combine music and poetry to create a celebration ceremony for fall harvest.
Suppose you were a mummy brought back to life. Keep an adventure dairy.
Categorize Egyptian statuary by meaning, expense, etc.

Evaluate

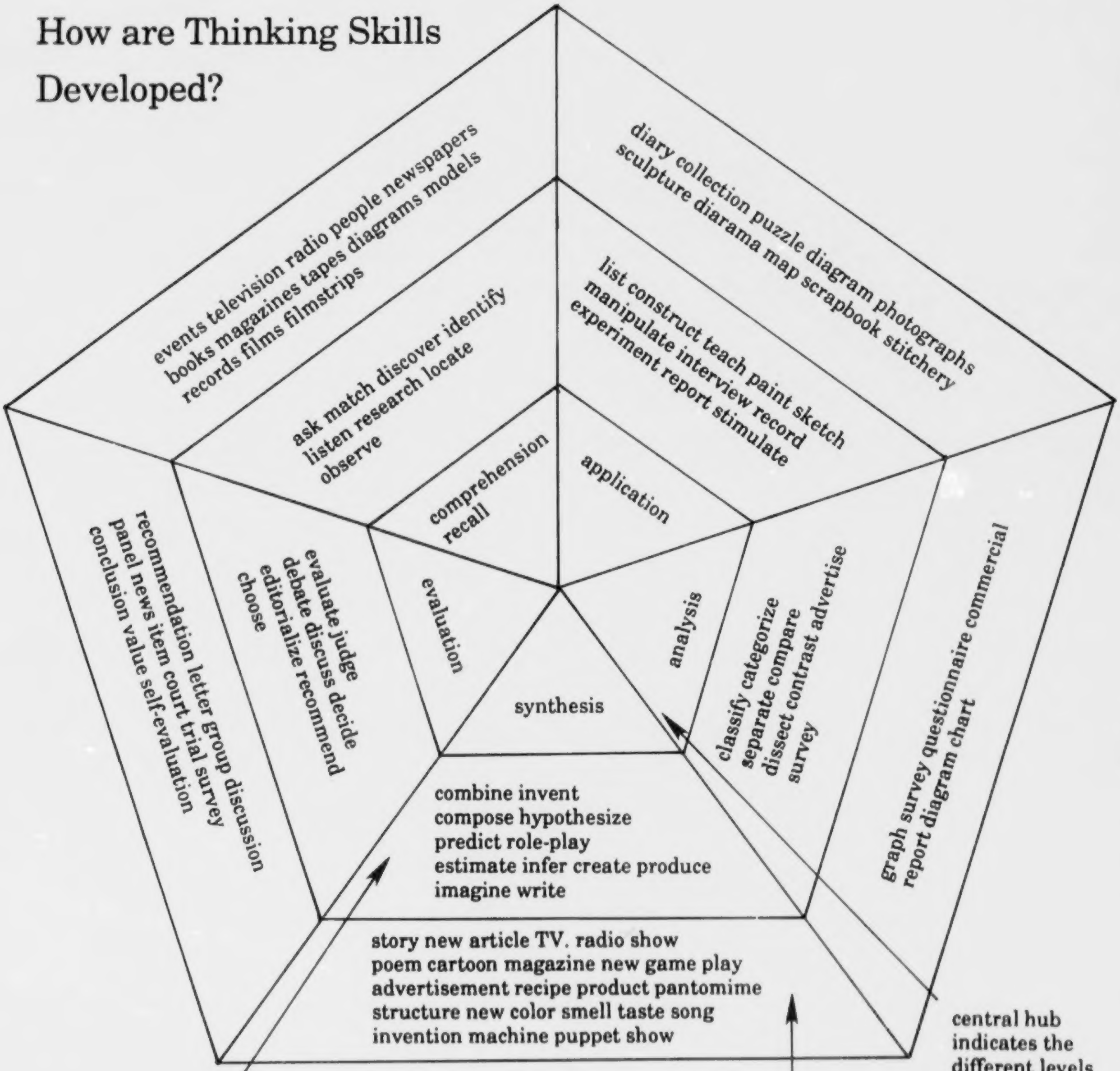
Rank the gods according to the importance of function (in your opinion).
Judge the role of the priest in the power structure of Egypt.
Evaluate the effectiveness of Egyptian farming methods.
Award the "Queen of the Year" prize to the one you feel did the most for Egypt. Support views with facts.
Justify your choice of the most important gifts of Egypt to us.
Defend the expense of building a pyramid from a pharaoh's viewpoint.
Find a judgment a pharaoh made, such as a death sentence, and criticize it.
Evaluate Egyptian architecture by your own established criteria.

Goldilocks and The Three Bears

Try to decide what level of Bloom's Taxonomy each activity is geared to. Using the terms and examples on the previous pages to assist you, label the following items indicating the appropriate level of Bloom's taxonomy.

1. What type of story is Goldilocks and the Three Bears?
2. List other fairy tales.
3. Describe Goldilocks.
4. Compare/contrast Goldilocks with the heroine of another fairy tale.
5. Construct a diorama of a scene from Goldilocks.
6. Suppose Goldilocks left the house before the three bears came home. How would that have affected the ending? Write a new ending.
7. Debate: Was Goldilocks justified in doing what she did, i.e. breaking into someone's home?
8. Construct a mobile showing scenes from Goldilocks.
9. Write a diary as if Goldilocks were writing it.
10. Design a board game based on the Goldilock's story.
11. Draw a flow chart tracing the storyline of Goldilocks.
12. Do an improvisational skit.
13. Prepare two newspaper editorials: one defending Goldilocks' actions, one criticizing them.
14. You're a reporter: interview Goldilocks and/or the bears.
15. Write a commercial advertising the book.
16. Make a filmstrip of the story.
17. If Goldilocks was hungry and lost, what other solutions could she have found to her problems?

How are Thinking Skills Developed?



comprehension recall
application
analysis
synthesis
evaluation
ask match discover identify listen research locate observe
list construct teach paint sketch manipulate interview record experiment report stimulate
classify categorize separate compare dissect contrast advertise survey
combine invent compose hypothesize predict role-play estimate infer create produce imagine write
evaluate judge debate discuss decide editorialize recommend choose
events television radio people newspapers books magazines tapes diagrams models records films filmstrips
diary collection puzzle diagram photographs sculpture diarama map scrapbook stitchery
graph survey questionnaire commercial report diagram chart
story new article TV. radio show poem cartoon magazine new game play advertisement recipe product pantomime structure new color smell taste song invention machine puppet show
recommendation letter group discussion panel news item court trial survey conclusion value self-evaluation

central hub indicates the different levels of thinking.

For each level a set of process verbs is suggested to stimulate thought.

The outer section lists possible outcomes if products or projects are required. (Note: Not all activities require a tangible result. In addition, those outcomes suggested may be used for a variety of thinking levels)

Mary Had a Little Lamb

Mary had a little lamb,
Its fleece was white as snow;
And everywhere that Mary went
The lamb was sure to go.

It followed her to school one day,
Which was against the rule,
It made the children laugh and play
To see the lamb at school.

And so the teacher turned it out,
And still it lingered near,
And waited patiently about
Till Mary did appear.

What makes the lamb love Mary so?
The eager children cry;
Why, Mary loves the lamb you know,
The teacher did reply.

Using Bloom's Taxonomy, create an activity for each cognitive level.

Knowledge

Comprehension

Application

Analysis

Synthesis

Evaluation

Questioning Models

Now that you have demonstrated your ability to identify the levels of Bloom's taxonomy, SAGE has provided the following questioning models which enable you to utilize your own content to develop the thinking processes of analysis, synthesis, and evaluation. Listed below is an outline of the thinking skills in each of the cognitive areas which have been utilized in developing the questions.

Analysis

Determining cause-effect relationships; categorizing, classifying, comparing and contrasting; making hypotheses based on pertinent information; selecting pertinent information, separating fact from opinion; detecting fallacies in reasoning; completely analyzing the structure of something.

List of questions follows:

Determining Cause-Effect Relationship

What effect does _________ have on _________?
What are all the consequences of _________?
What is the relationship between _________ and _________?
How does _________ influence _________?
How does _________ contribute to _________?
What caused _________?
List the major implications of _________.

Categorizing, Classifying, Comparing, Contrasting Ideas

What do _________ and _________ have in common?
What are all the ways you could classify (regroup) _________?
How are _________ and _________ different?
How will _________ and _________ be different?
Into what category do all these (ideas, objects, actions, phrases) _________ fit?
What are all the benefits and disadvantages of _________?
Compare _________ with _________ in at least three different ways?
Outline the table of contents of a book about _________.

Making Hypotheses Based on Pertinent Information.

What might be all the reasons for _________?
What would happen if _________?
What would happen if _________ and then _________?

Selecting Pertinent Information, Separating Fact from Opinion, Detecting Fallacies in Reasoning

In order to help solve the problem of _________, what _________ would you need?
In order to _________, what _________ will you need?
Given _________ and _________, what will you need?
In order to justify or defend _________, what _________ will you need?
What are all the reasons for _________?
What might be all the reasons for supporting or refuting this statement: _________?

Completing Analogies, Making Associations, Analyzing the Structure of Something

How is a _________ like a _________?
I only know about _________. Tell me about _________.
Describe _________. (Paradox, such as "pleasing irritation", "small bigness")
Which is _________, a _________ or a _________?

Synthesis

Productive thinking components of fluency, flexibility, originality and elaboration are used to:

- Propose new solutions to problems
- Originate a new plan
- Utilize concepts to create new ideas
- Seek out unusual resources
- Modify a plan
- Create a new set of patterns
- See new associations
- Ask what if, or just suppose

The following is a list of synthesis questions proposing new solutions to problems, originating a new plan, utilizing concepts to create new ideas, producing an original product

Design _________ which will _________.
Create a new _________ for the _________.
Plan _________. Make it something no one has ever thought of before.
Design _________. Think of the most unusual _________ you can.
Create the ideal _________.

Seeking out unusual resources

What are all the different uses for _________?
What are all the different ways one could _________?
Make a list of all _________ that _________.

Modifying a plan, creating a new set of patterns

What are all the ways you could improve _________?
How could you make _________ (better, stronger, more creative)?

Seeing new associations

Tell how _________ would be viewed by _________.
Become _________. Tell how it feels to be _________.
Asking "what if" or "just suppose"
What if _________?
Just suppose _________.

Evaluation

Making judgments, critiques, develops criteria, generates alternatives, determines a solution, develops an action plan

Will _______ work. How can you tell?
Define your position regarding___________.
Evaluate _________ and list the criteria you used.
How would you rate _________?

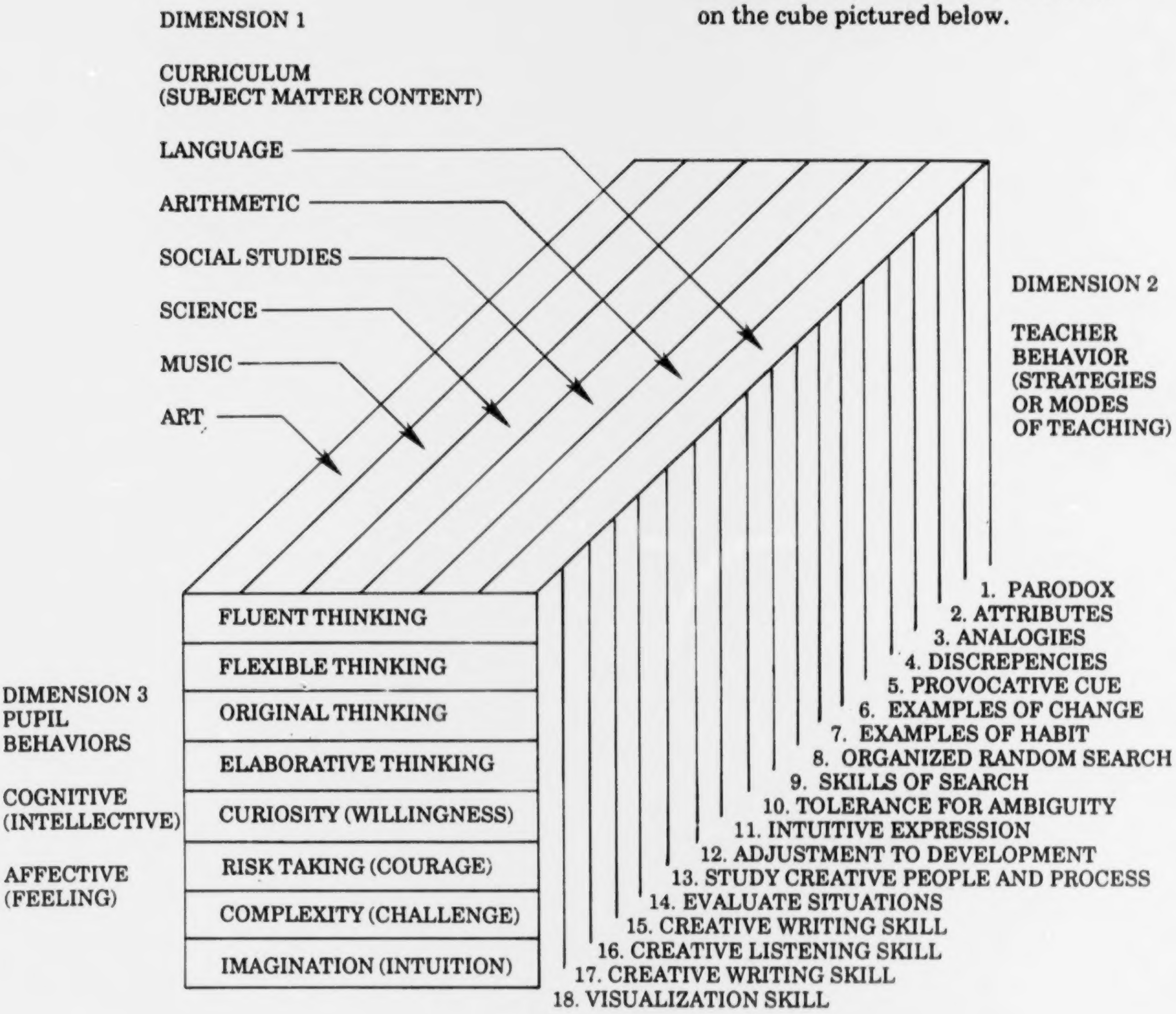
Challenge this statement (supply the statement to be challenged).

What conclusions can you draw regarding ________?
Rate ________, ____________, and ________ in order of your preference.
Judge ___________ by the information you have.
Evaluate a solution to _____________.
Estimate the value of ___________.
Why is _________________ so important?
What is your opinion of ___________? Justify this.

Frank Williams' Learning Cube

The Williams' Model has been adapted by the SAGE Program because it utilizes and includes teaching behaviors (strategies) that focus in on important content areas that are designed to produce certain student outcomes. The unique feature of this model is that it allows for the interaction of curriculum content (D1) with teaching strategies (D2) to produce pupil behaviors (D3). This can be observed on the cube pictured below.

$D1 \rightleftarrows D2 \rightarrow D3$


DIMENSION 1
CURRICULUM (SUBJECT MATTER CONTENT)
LANGUAGE
ARITHMETIC
SOCIAL STUDIES
SCIENCE
MUSIC
ART
DIMENSION 2
TEACHER BEHAVIOR (STRATEGIES OR MODES OF TEACHING)
1. PARODOX
2. ATTRIBUTES
3. ANALOGIES
4. DISCREPENCIES
5. PROVOCATIVE CUE
6. EXAMPLES OF CHANGE
7. EXAMPLES OF HABIT
8. ORGANIZED RANDOM SEARCH
9. SKILLS OF SEARCH
10. TOLERANCE FOR AMBIGUITY
11. INTUITIVE EXPRESSION
12. ADJUSTMENT TO DEVELOPMENT
13. STUDY CREATIVE PEOPLE AND PROCESS
14. EVALUATE SITUATIONS
15. CREATIVE WRITING SKILL
16. CREATIVE LISTENING SKILL
17. CREATIVE WRITING SKILL
18. VISUALIZATION SKILL
DIMENSION 3
PUPIL BEHAVIORS
COGNITIVE (INTELLECTIVE)
AFFECTIVE (FEELING)
FLUENT THINKING
FLEXIBLE THINKING
ORIGINAL THINKING
ELABORATIVE THINKING
CURIOSITY (WILLINGNESS)
RISK TAKING (COURAGE)
COMPLEXITY (CHALLENGE)
IMAGINATION (INTUITION)

To gain understanding of each level or dimension, we include Williams' description of his content, process and strategy model below.

Dimension 1 is Curriculum (Subject Matter Content), with the six levels of art, music, science, social studies, arithmetic, and language. Dimension 2 is Teacher Behavior (Strategies or Modes of Teaching) and includes 18 activities and skills (defined in Table 8.2) that teachers may use to teach skills in any of the 6 content areas.

Dimension 3---containing the "thinking and feeling process" for which Williams is famous--is called Pupil Behaviors. Its eight levels include the four Cognitive (Intellective) processes of fluency, flexibility, originality, and elaboration, plus the four Affective (Feeling) processes of curiosity (willingness); risk taking (courage), complexity (challenge), and imagination (intuition)." (Davis & Rimm, 1985) pp. 174, 176.

Dimension 2, Teacher Behaviors, provides assistance in determining learning activities to be used in teaching a particular content area. Each of the 18 behaviors is explained on the chart which follows.

DIMENSION 2

Teacher Behaviors (Strategies)

PARADOXES	Common notion not necessarily true in fact, Self-contradictory statement or observation
ATTRIBUTES	Inherent properties, conventional symbols or identities
ANALOGIES	Situations of likeness, similarities of likeness, similarities between things, comparing one thing to another
DISCREPANCIES	Gaps of limitations in knowledge, missing links in information, What is not known
PROVOCATIVE QUESTIONS	Inquiry to bring forth meaning, incite knowledge exploration, summons to discovering new knowledge
EXAMPLES OF CHANGE	Demonstrate the dynamics of things, provide opportunities for making alterations, modifications or substitutions
EXAMPLES OF HABIT	Effects of habit-bound thinking, building sensitivity against regidity in ideas and well-tried ways
ORGANIZED RANDOM SEARCH	Using a familiar structure to go at random to build another structure, an example from which new approaches occur at random.
SKILLS OF SEARCH	Search for ways something has gone wrong before (historical search), search for the current status of something (descriptive search), set up an experimental situation and search for what happens (experimental research)
TOLERANCE FOR AMBIGUITY	Provide situations which puzzle, intrigue or challenge thinking, pose open-ended situations which do not force closure.
INTUITIVE EXPRESSION	Feeling about things through all the senses, skill of expressing emotion, be sensitive to inward hunches or nudges.
ADJUSTMENT TO DEVELOPMENT	Learn from mistakes or failures, develop from rather than adjust to something, developing many options or possibilities.
STUDY CREATIVE PEOPLE AND PROCESS	Analyze traits of eminently creative people, study processes which lead to problem-solving, invention, incubation and insight.
EVALUATE SITUATIONS	Deciding upon possiblities by their consequences and implications, check or verify ideas and guesses against the facts.
CREATIVE READING SKILL	Develop a mind-set for using information that is read, learning the skill of generating ideas by reading.
CREATIVE LISTENING SKILL	Learning the skill of generating ideas by listening, listen for information allowing one thing to lead to another.

GLOSSARY

Analysis	Asking why. Recognizing rules of logic. The pupil will determine the nature of something, by breaking unique characteristics.
Attributes	Characteristics as in size, shape, texture, color, form, that enable students to categorize, and classify given objects.
Brainstorming	The ability to generate as many ideas as possible on a given topic. Emphasis is placed on quantity of ideas, rather than quality which will not inhibit the flow of ideas. The two basic rules are: no idea that relates to the topic is silly, and no judgments should be made. Children are encouraged to "hitch- hike", get ideas from other ideas.
Convergent Thinking	Coming up with one expected answer. Thinking along one line--one track.
Creative Problem-Solving	Fact-finding, problem-solving, idea-finding, solution-finding, acceptance-finding. A process in which decisions are made and implemented in a logical manner.
Critical Thinking	The ability to look at situations with an open mind and provide evidence, thus supporting decisions made.
Deductive Reasoning	Based upon given information (clues), students are able to draw logical conclusions in order to reach a final solution.
Divergent Thinking	Coming up with many, or a wide variety of answers. The answers are not expected nor is there one right answer.
Elaboration	The ability to embellish upon an idea, produce detailed steps, to embroider, stretch or expand upon things or ideas. Example: Given a simple outline of a road, children are asked to add as many details as they can to create a unique scene. To further develop this, they may be asked to write a story or a poem.
Evaluation	The pupil is asked to make judgments upon a good or preferred solution to problems. The judgments should be made according to evidence or standards.
Figural Analogies	Seeing how two objects relate to one another in order to create another pair of the (having the) same association.
Figural Patterns	Children are required to observe carefully in order to determine characteristics of a given object. Students are then able to categorize the objects and create more on their own.
Flexibility	The ability to produce many categories of responses, also the ability to shift categories. Example: A coat hanger may be used for many things, such as garments or it may be used for construct a mobile. How many other uses can you think of?
Fluency	The ability to produce many ideas/responses in a given time.

Inductive Reasoning	Allows students to generate conclusions not solely based on given information, but on their ability to reach a conclusion which is somewhat supported, but not necessitated by the premises he/she uses.
Inferences	Based on given information, students can generate good arguments and discussions as to what are the reasonable and unreasonable conclusions.
Relevant Information	Information that relates to the topic.
Sequences	The perception of the relationships from one figure or word to the next in order to discern what follows in the pattern.
Synthesis	The pupil is asked to be creative in thought and produce something original, different and unique.
Syllogisms	Syllogisms are problems that help strengthen analytic thinking. A syllogism is made up of three sentences or statements. The three sentences or statements are referred to as an argument. The first two statements are called premises. The third sentence is called the conclusion. A syllogism always contains clues that support or prove the conclusions. Syllogisms are worded in a special way. Premises begin with "a", "all", "no", or "some"; they use the verbs "is", "are" or "are not". A conclusion begins with the word "therefore". It is not important whether or not the premises are true or whether they make sense. Your only concern is that the two premises do prove the conclusion. If a conclusion follows logically from the two premises, an argument is said to be valid. If a conclusion does not follow logically from the two premises or is not supported by the two premises, an argument is said to be invalid. Example: *All bears have fur.* *All Kodiaks are bears.* *Therefore, all Kodiaks have fur.*
Verbal Analogies	Seeing how two words relate to one another in order to create another pair of words having the same association.
Verbal Classification	The organization/classification of words based on letter patterns, common definitions, or the configuration of words themselves.

Bloom's Taxonomy

1. ***Knowledge:*** Knowledge refers to the ability to recognize or recall information. Teaching this phase of the taxonomy merely involves "pouring in" information.

This phase of instruction is usually accomplished in a formal setting. It can be accomplished with very large groups.

A. Activities usually done by student: (1) responds to classroom situation--is attentive; (2) absorbs information--looks, listens, reads; (3) remembers; (4) practices effective procedures--drills, recites; (5) covers information in books; (6) recognizes information that has been covered.

B. Evidence of student's success: (1) completes class and homework assignments; (2) completes programmed learning sequences; (3) scores satisfactorily on objective tests.

C. Activities usually done by teachers: (1) directs student activities; (2) gives information--lectures, drills; (3) shows information--audio-visuals, demonstrations; (4) enlarges information; (5) makes and administers objective tests; (6) makes homework assignments.

D. Sample questions: (1) What is the formula for finding the circumference of a circle? (2) What are the three types of burns and standard treatment for each? (3) What nations cooperate in the European Common Market? (4) What is the Haber process for making nitrogen?

2. ***Comprehension:*** Comprehension represents the lowest level of understanding. The student should be able to make some use of the knowledge that he has gained, but he may not necessarily be able to relate it to other material or see its fullest implications.

This instruction is usually accomplished in a formal setting with a group no larger than a typical class.

A. Activities usually done by student: (1) explains information rather than merely quotes it; (2) makes simple demonstrations; (3) translates information into his own words; (4) extends information to new situations; (5) interprets information from technical terms to familiar terms.

B. Evidence of student's success: (1) has the ability to intelligently discuss information; (2) can write simple essays; (3) scores satisfactorily on objective tests.

C. Activities usually done by teachers: (1) demonstrates material; (2) listens to students; (3) asks questions; (4) compares and contrasts students' answers;

(5) examines students' ideas; (6) makes and administers objective tests and low-level essay tests; (7) makes carefully selected homework assignments.

D. Sample questions: (1) Explain the meaning of flag signals. (2) Change a written math problem into a formula. (3) What is the meaning of "your rights stop where my nose begins"?

3. ***Application:*** Application refers to the ability to use abstractions in particular and concrete situations. An example of this phase could be the using of an abstract mathematical formula to solve a specific math problem. In this phase instruction is usually rather informal. It is readily adaptable to laboratories, shops, the field, the stage, or to small groups within the classroom.

A. Activities usually done by the student: (1) solves novel problems; (2) constructs projects, models, apparatus, etc.; (3) demonstrates use of knowledge.

B. Evidence of student's success: (1) masters problem- solving tests; (2) constructs equipment, models, graphs, etc.; (3) demonstrates ability to use equipment.

C. Activities usually done by teacher: (1) shows students ways to facilitate their work; (2) observes students' activities; (3) criticizes students' activities; (4) helps design students' projects; (5) organizes field trips and contests.

D. Sample questions: (1) What could a fully clothed person do to remain afloat in water for several hours? (2) What general principles of learning can be used in improving reading?

4. ***Analysis:*** Analysis refers to the breaking down of a communication into its basic parts. This allows the relationship between ideas to be seen more clearly and allows basic arrangements to be studied. This phase of instruction is best conducted in an informal and irregular manner. Small group and independent study techniques are especially useful here. Homework assignments directed toward analysis have been especially valuable.

A. Activities usually done by student: (1) discusses information in depth; (2) uncovers interrelationships among ideas; (3) discovers deeper meanings and insinuations that were not apparent at first; (4) sees similarities and differences between styles.

B. Evidence of student's success: (1) makes effective outlines; (2) writes effective precis; (3) completes effective experimental write-ups.

C. Activities usually done by teacher: (1) probes, guides and observes students; (2) acts as a resource person; (3) plans for and conducts discussions, seminars, and group critiques.

D. Sample questions: (1) What are the elements of the nitrogen cycle, food chain, taxation, and inflation? (2) Look at the "Mona Lisa" and tell which elements and principles of art were used by the artist.

5. ***Synthesis:*** Synthesis is the putting together of elements or parts so as to form a whole. It is the arranging and combining of pieces to form a pattern or structure that was not clearly evident before. This phase of the Taxonomy is especially adaptable to independent study. It can be accomplished in almost any setting including the home. The library is especially useful. Much reflection is generally required--these results often come slowly. Patience is necessary.

A. Activities usually done by student: (1) produces unique communications; (2) formulates new hypotheses based on analyzed information; (3) makes discoveries and generalizations; (4) shows relationships between ideas and philosophies; (5) proposes new ways of doing things.

B. Evidence of student's success: (1) activities (as above) effectively completed; (2) writes quality essays and term papers; (3) makes blueprints or sets of plans for projects.

C. Activities usually done by teacher: (1) extends students' knowledge; (2) analyzes and evaluates students' work; (3) prepares reading lists--including critical questions; (4) brings in consultants; (5) plans seminars; (6) allows for independent study.

D. Sample questions: (1) Combine poetry, modern dance, music, and colored light into a presentation which emphasizes basic principles of American democracy. (2) Create a 3-D object which highlights Einstein's fourth dimension.

6. ***Evaluation:*** Evaluation involves making judgments about the value of materials, methods, or ideas for a given purpose. This represents the highest level of intellectual functioning. This process is difficult for even the brightest students. Results should not be expected to come quickly. Students should not feel rushed. This phase must be taught in a very informal manner and is handled best in small groups.

A. Activities usually done by student: (1) makes firm commitments; (2) judges quality based on sound criteria; (3) effectively supports or disputes ideas, theories, etc.

B. Evidence of student's success: (1) oral and written critiques are logical; (2) speeches and essays are based on sound information; (3) projects are completed successfully; (4) performance is effective (athletic, artistic, musical).

C. Activities usually done by teacher: (1) accepts students' ideas; (2) plans competitive essay assignments; (3) plans tournaments (speech, debates, etc.); (4) helps establish criteria for evaluations.

D. Sample questions: (1) Decide whether or not the film HAWAII is an accurate portrayal of Hawaiian life at the time of the early missionaries. (2) Decide whether or not the United States should supply fish protein to persons in underdeveloped countries. What might be some repercussions from this act? (3) List some of our current national problems in order of importance.

While gifted curriculum usually emphasizes the upper three levels of Bloom's Taxonomy (Analysis, Synthesis, Evaluation), the entire cognitive domain of the taxonomy should be considered in the context of gifted curriculum. Often, assumptions are made that gifted students are able to analyze, synthesize and evaluate when they lack experiences in acquiring, comprehending and applying knowledge as Bloom's Taxonomy is arranged in a hierarchical order based on the generalization of knowledge or knowledge transfer.

Appendix E

Forms to Assist with Differentiating the Curriculum into the Content

This is not a complete list of all creative abilities. Other areas which may be included are:

sensitivity to problems
visualization
transformation
intuition
producing logical solutions
problem defining
metaphorical thinking
extending boundaries
predicting outcomes

(Davis & Rimm, 1985, pp. 213-214)

The category of evaluation has been added to the creative productive process. Creativity and problem-solving have been combined and have been described by Parnes (1967), Torrance (1965, 1967), Guilford (1967), and others. The original set of creative problem-solving stages were suggested in 1926 by Graham Wallas. (Wallas, 1926) The stages included preparation, incubation, illumination and verification which closely parallel the process as described in this manual.

Brainstorming has become the foundation of creative problem- solving. Osborn (1954) identified the rules and conditions for brainstorming. The primary goal of any brainstorming session is to generate a list of all possible problem solutions. To achieve this, Osborn offers two basic rules for brainstorming sessions:

Defer judgment - criticism is ruled out -- judgment is suspended until a later evaluation session.

Reach for quality - the greater the number of ideas, the greater likelihood of winners.

In addition to the above, Osborn recommends *free-wheeling thought* -- the wilder the ideas, the better. Even offbeat, impractical suggestions may "trigger" in other panel members practical suggestions which might not otherwise occur to them. Combinations and improvements are also sought -- in addition to contributing ideas of their own, members should indicate how suggestions by others can be turned into better ideas, or how two or more ideas could be combined into a still better idea.

The following checklist by Osborn might be used to spur ideas.

Put to other uses? New ways to use it as is - other uses if modified.
Adapt? What else is like this? What other ideas does this suggest?
Modify? Change meaning, color, motion, sound, odor, taste, form, shape?
Magnify? What to add? Greater frequency? Stronger? Larger?
Substitute? What else instead? Who else instead? Other place or time?

Minify? Subtract? Eliminate? Smaller? Lighter? Slower? Split-up?
Rearrange? Other layout or sequence? Change pace?
Combine? How about a blend, an assortment?
Reverse? Opposites? Turn it backward? Upside-down or inside- out?

Sidney Parnes continued Osborn's work at the Creative Education Institute, Buffalo, N.Y. He has noted that "the plus ingredient that Alex Osborn introduced was the deliberate and exaggerated use of the imagination; this provided a powerful force when effectively harnessed within a total problem-solving model". (Parnes, in *Creativity*, 1981)

The creative problem-solving process is frequently utilized throughout SAGE's Trifold Curriculum, enabling students to apply the acquired skills to real-life situations. In addition, this provides a vehicle for the development of self-directed learning. This is a primary goal for gifted and talented education according to Treffinger.

"*Self-directed learning enhances the possibility of greater student involvement and strong positive motivation for learning*". Treffinger (in *Creativity,* 1981, p. 109)

Keys to Productive Thinking
Student Behaviors

Productive Thinking

Fluency	The student expresses many ideas, though not all of the highest quality. (These may not be the most talkative students.)
Flexibility	The student expresses a variety of kinds of responses (is able to change avenue of thought).
Originality	The student expresses unusual, uncommon responses. Many, though not all, of the ideas prove to be useful.
Elaboration	The student can build onto (or embroider) a basic idea by adding details to make it more interesting and complete.
Evaluation	The student weighs ideas, looking at the desirability and undesirability of each.

In order to elicit the type of student responses that generate divergent thinking, thus stimulating a wide variety of responses, the following questioning techniques are offered.

Fluency Questions

List all the _________.

How many ways can you come up with _________?

List as many _________ as you can.

What are all the possible solutions you can think of?

Flexibility Questions

Forced Association

How is a _________ like a _________?
Get ideas from _________ to improve _________.
I only know about _________. Explain _________ to me.

Involvement

How would _________ feel if it were human and had feelings?
How would you feel if you were _________?
You are a _________. Describe how it feels.

Reorganization

What would happen if _________ were true?
Suppose _________ happened; what would be the consequences?
What would happen if there were no _________?

Originality Questions

Design a _________ that is different.

You are the designer. Can you think up a new _________?

How can you improve the design of _________?

Elaboration Questions

Add on details to _________.

Add illustrations to _________.

Take _________ and stretch or expand on it by adding ideas.

Examples of Productive Thinking

Content: Futuristics

Fluency:

List as many futuristic words as you can.

What are some things that are changing for the better?

Forecast trends for the year 2000.

Flexibility:

The future is like a tree because ...

Is the future like a straight line or a circle? Why?

What things could you substitute for fossil fuels?

What else is like pollution?

Originality:

If you could pass a law that would have an effect on a future trend, what would it be?

Answer: The future. What is the question?

If you could make one statement of 25 words to the people of the world concerning the future, what would you say?

Describe the earth from the viewpoint of a space colony.

Elaboration:

What do you see in the junkyard of the future? What else would you like to put there?

What would you make stronger to be more effective?

What would you make more abundant to be more useful?

If you could buy insurance for the future, what would you want it to cover?

Evaluation:

What are some things that we are dependent on? Which are real? Which are created dependencies?

If you could leave your grandchildren one thing from your lifetime, what would it be? Of what benefit would this be to them?

List the pros and cons of living in an underground home.

Why is it necessary to begin to develop alternate energy sources for the future?

CREATIVE PROBLEM-SOLVING

The Creative Problem Solving Process encourages people to become more proficient at generating original solutions to problems. This process employs the critical thinking skills of analysis, synthesis, and evaluation. In stating five basic steps which are utilized in the critical thinking process, Feldheusen and Treffinger noted, "Critical Thinking involves creative thinking because it requires the thinker to assimilate information and hypothesize solutions to problems."* They list the following five steps in the critical thinking process as:

1. **Reorganizing problems**
2. **Formulating hypotheses**
3. **Gathering pertinent facts or data**
4. **Testing and evaluation**
5. **Drawing conclusions***

These steps have been developed into a formal process as follows:

Problem Identification

Examine the situation. What do we know? What is ambiguous? What terms need to be defined? What else do we need to know?

Appropriate background research is conducted at this stage of the process. Brainstorm all possible problems which might occur from the situation.

Recognize and Clarify the Problem

Which problem is most basic? Which problem would incorporate several of the smaller problems?

Sample ways to use critical thinking skills:

-Look at the attributes of the problem

-Determine the cause of the problem and the effect of the problem on other situations

-Analyze sub-problems

State the Problem Clearly

Using the following abbreviation from the Creative Problem Solving Institute in Buffalo, New York, I W W M I, or in other words, In What Ways Might I...

Here you synthesize all of the information generated in steps 1 and 2 to state the problem as specifically as you can.

Generate Alternative Solutions

Brainstorm all possible solutions to the stated problem.

Use the SCAMPER technique.

All elements of productive thinking are encouraged.

Evaluate Alternative Solutions

Select the top five ideas (this number can vary).

Use an evaluation grid to record these ideas.

Develop criteria to evaluate ideas.

Record criteria value (1-5 with 1 poorest and 5 highest) for each idea.

Total scores for each solution, highest scoring solution wins.

Develop Action Plan for Implementation

Brainstorm ways to implement the solution and select those that appear to be the most effective.

Develop a timeline and sequence - What needs to be done first? When? How?

Who will do what? Where? Why?

List potential problem areas.

How can these problems be avoided? What resources are available to assist with the implementation of this solution?

Locate the sample lesson from the Alternate Energy Unit. This will allow you to experience the creative problem solving process. Record your information on the handouts provided. A sample of the handout is provided for you to duplicate when utilizing this process.

*Taken from Feldheusen, John and Treffinger, Donald, *Creative Thinking and Problem Solving in Gifted Education*, Dubuque, Iowa, Kendall Hunt Publishing Company, 1980, page 38.

A PROBLEM-SOLVING MODEL

1. What important facts can you state about the situation?
2. State the major problem?
3. List as many ways as you can to deal with the problem. These are your alternatives.
4. Select the three best ideas and enter them on the decision-grid below.
5. Two criteria for judging ideas are provided in the grid. Add a third criterion of your own.
6. Evaluate each idea on a scale of one to five. A poor rating is one, a high rating is five.

Scale 1-5

Best Ideas	How Long Will It Take?	How Much Will It Cost?	Your Criteria

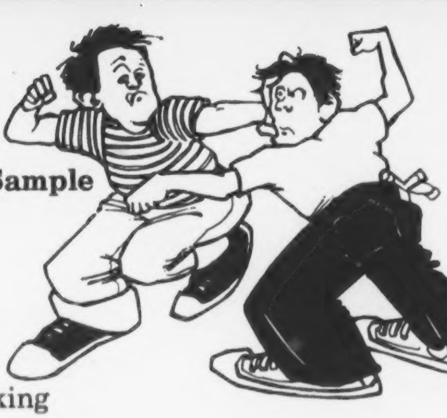
7. Total the score for each idea.
8. The best solution to the problem is:

CREATIVE PROBLEM-SOLVING

(adapted from R.B. Noller)

Topic Example: Children's Playground Concerns

TASK	
Problem Generation	
• Brainstorm Problem Identification	• Fluency, Flexibility, Originality, Defferred Judgment
• Select most critical and general problems	• Evaluation
Problem Clarification	
• Illustration of the problem	• Analysis, Evaluation
• Things that cause the problem	
• Further problems caused by the problem	
Problem Identification	
• Restate the problem after clarification	• Synthesis
Idea Finding	
• What could we use?	• Fluency, Flexibility, Analysis, Originality, Defferred Judgment
• What could we do?	
• Use creative thinking techniques 1) forced association 2) synectics 3) attribute listing 4) idea spurring	
Finding a Solution	
• Pick out the best elements from "idea finding"	• Synthesis
• Put together a solution	• Elaboration
• Does it fit the problem?	• Evaluation
Putting the Solution to Work	
• Who will do what?	• Synthesis, Evaluation,
• How?	• Originality, Flexibility
• When?	
• Where?	
• What should we watch for?	
• How can we convince others?	



Using CPS to Solve Playground Problems: A Sample

Teaching Creative Problem-Solving

Grade Level: 1-6

Cognitive Level(s): Analysis, Synthesis, Evaluation

Skill: Creative Problem-Solving (all major thinking skills)

Objective: Students will learn the creative problem-solving process by generating and solving a problem encountered on their school playground.

Tell students that they will be learning the creative problem- solving process using real problems they encounter each day on the playground. Each part of the process is briefly described and a copy of "A Problem-Solving Model Worksheet" is given to the students as a guide. For the initial learning experience, students work in groups of 4 with a recorder writing responses on large chart paper that can be posted around the room. Ask students, "What are some of the problems you observed on the playground?"

Description of Learning Activities:

Problem Generation	In groups students brainstorm problem areas. Allow 15-20 minutes. Have students select the most critical and general problems. Ask them to select 3, then one as their major focus.
Fact-finding	Ask each group to provide details about the problem. What might cause the problem? Use the 5 W's--who, what, when, where, and why - what other problems may be caused by the problem?
Problem Statement	Restate the problem using the following phrase to begin, "In What Ways Might We.....?"
Idea Finding	Students brainstorm possible solutions. Stress creative thinking techniques such as SCAMPER, attribute listing, synectics, etc.
Finding a Solution	Have students select 3-5 of their best ideas. Ask them to provide or have the teacher present 3 criteria to evaluate their ideas (Suggestion: time, money, resources available). They may combine some of the best elements of their ideas for a solution. Have them evaluate the solution to determine whether it is an appropriate solution to the problems.
Action Plan	Have students develop an action plan in the form of a proposal to "sell their solution." Ask them to consider who, where, what, when and why and draw a timeline. Have them list probable pitfalls or opposition to the plan and how these can be overcome. Put the plan into action and solve the problem.

CRITICAL THINKING

There is more to thinking than meets the ear. The ability to give the right answer to a question may or may not be a significant accomplishment, depending on the thought processes that took place before the answer surfaced. Critical thinking involves evaluation and consideration of the information available because it requires the thinker to assimilate information and hypothesize solutions to problems.

Five basic steps are employed in the critical thinking process:

Recognizing problems
Formulating hypotheses
Gathering pertinent facts or data
Testing and evaluation
Drawing conclusions

Classroom activities can be geared to developing critical thinking in children. Instruction can be organized in such a way that children are supplied background information and allowed to manipulate the information and discuss problems in order to discover their own conclusions.

Questioning and discussion sessions which employ divergent questioning techniques facilitate critical thinking. Children who are critical thinkers also need to be questioning learners. Situational learning which provides information but causes a child to seek information rather than simply to process given information will aid in the development of critical thinking. Learning by doing, role playing, solving cases and problems, and experimentation are situational learning experiences. Simulations are also excellent ways to actively involve students in a learning situation and to induce and teach critical thinking.

LOGIC PROBLEMS -- Deductive Reasoning and Convergent Thinking

Convergent thinking refers to the process whereby the student takes a large number of facts and associations and puts them together in certain predictable combinations to come out with the one right possible answer. The clearest academic illustrations of convergent thinking can be found in arithmetic reasoning problems, where the student takes a variety of facts and pulls them together to come out with the right answer. All instances of deductive reasoning involve convergent thinking.

Although convergent thinking has been most often identified with the sciences and mathematics, it is found quite regularly in other subject areas as well. Any problem that has a large amount of given information and that requires close logical reasoning to reach a valid conclusion calls for convergent thinking.

Activities included in this section will help to stimulate convergent thinking and deductive reasoning.

Putting Theories Into Practice

The preceding sections, focusing on approaches to teaching thinking skills, have been provided in order for you to understand the processes employed by SAGE. Our aim is to use metacognition (i.e. thinking about thinking) rather than following a prescribed formula.

The major goal of the program is for teachers to raise the cognitive level of questioning, therefore encouraging students to use the higher level thinking skills. We have identified the thinking skills that need to be taught in order to allow for student growth in critical/creative thinking. The approaches to thinking skills provide a basic "how to", an overview of strategies necessary for teaching specific skills. Teachers and students need a repertoire of thinking skill strategies that are taught in the initial stages of the program and will enable them to think at higher cognitive levels.

How do you teach thinking skills? The SAGE Program teaches thinking skills in isolation at the introductory stages of the program. It is important for both teachers and students to become familiar with the vocabulary in thinking skills development. Although many of the terms are part of your teaching vocabulary, a glossary has been included of all pertinent definitions to allow for consistent and universal usage. Thinking skills are most often taught in conjunction with classroom content and real-world situations. (See Appendix D)

Lessons to Initiate Your Thinking Skill Program

Great Beginnings

Creative Thinking Lesson

Grade Level: Can be adapted for Grades K-6

Thinking Skills: Productive Thinking, focus on brainstorming rules, developing fluency and elaborative thinking.

Objective: Students will brainstorm all the things that have/contain holes.

Introduction:

> Familiarize students with the rules of brainstorming.
> For each student supply a blank sheet of paper containing a hole somewhere on the sheet of paper. Ask student to imagine all the possible things that might have a hole.

Description of Learning Activities

Allow students 15 minutes to list as many items having holes as possible.

Gather ideas (student responses) listing on the board all suggestions. All responses must be included at this point.

Have students identify their most unique response.

Taking the blank sheet of paper containing the holes, students are asked to elaborate, adding detail around the hole, thus embellishing their idea of what they see.

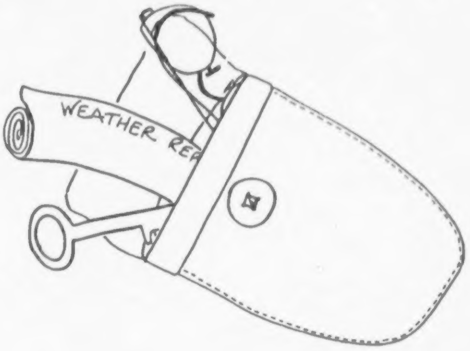
Students then share their idea with the class.

Another brainstorming suggestion: What's in a pocket?

Have students brainstorm all possible items to be found in a pocket. After sharing student lists, instruct children to create the pocket of a famous person/character (i.e. Sherlock Holmes, Mickey Mouse, Darth Vadar, etc.) by illustrating the pocket and items found within.

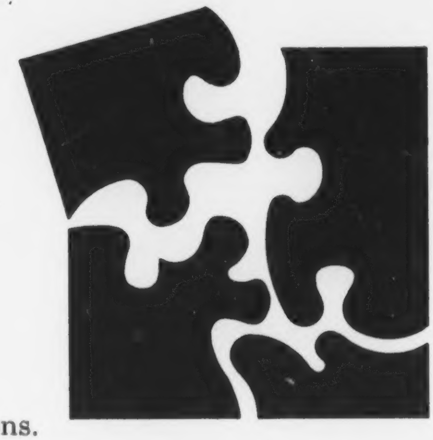
Ben Franklin's pocket

Relate this to your topic of study in the classroom. (Pioneer's pocket, person of a different country, scientist's pocket, etc.).



Put On Your Thinking Cap

A lesson in Logic



Grade Level: Grades 2-6

Thinking Skills: Logic elimination Analysis Deductive Reasoning

Objective: Given a set of clues, students will analyze their meanings in order to determine the appropriate solutions.

Introduction

Logic puzzles enable students to analyze bodies of information, weigh facts and eliminate unlikely possibilities in order to reach a final solution. To introduce the logic puzzle simplified examples are necessary for students to begin breaking down information into workable components (analyzing). Try the following linear representations with students. Let students try to make sense out of the confusing descriptions and situations.

On the daily walk that Mark, John, Peter and Joe take to school, Mark walks farther than John. Peter walks farther than Joe, but not as far than John. Can you tell who lives farthest from school and who lives nearest?

Charles, Henry, Robert and James differ in weight. Charles weighs less than Robert. Henry weighs less than Charles, but more than James. Who is the heaviest?

If Robert and Alfred are both happier than Thomas, while Albert is less happy than Robert, but happier than Alfred, who is the least happy?

Students can make up their own linear representations for others to analyze. Linear representations are often found as clues in logic puzzles.

Description of Learning Activities

Introduce the logic puzzle to students. Begin with the following (which can be written on the board or provided to each student in handout form).

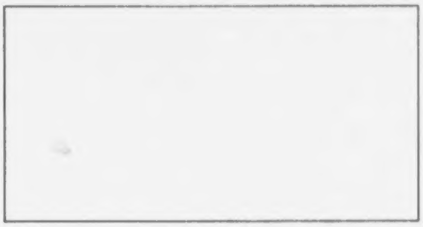
He Gave It His Best Shot

Sam, Tim, John and Greg are competing. Who placed first, second, third, and fourth?

Sam did not beat Greg.
John beat Sam.
John almost beat Greg.
Sam did not beat Tim.
Greg and Tim came before John and Sam.
Tim's score was higher than Greg's and Sam's together.

A major component to logic puzzles is getting the facts straight. Introduce the grid/matrix technique to students.

First draw a box.



Then draw lines in the box, one for each child's name (lines across and down).

	Sam	Tim	John	Greg
1ST				
2ND				
3RD				
4TH				

Place children's names across the top.

Write (places) numbers along the side.

Students now have a visual display on which to mark possibilities or impossibilities. Students should place an "X" when eliminating a possibility and a "   " to identify an appropriate answer.

	Sam	Tim	John	Greg
1ST	X	✓	X	X
2ND	X	X	X	✓
3RD	X	X	✓	X
4TH	✓	X	X	X

Review all clues with students, analyzing the facts. Discuss likelihoods of student placement (1st, 2nd, 3rd, 4th) in the competition. Discuss strategies employed in linear representations and how they could be related here.

Follow-up:Commercially available puzzles can be found through the following companies:

Seymour Publications P.O. Box 10888 Palo Alto, CA 94303	-	Quizzles
Midwest Publications P.O. Box 448 Pacific Grove, CA 93950	-	Brainteasers
D.O.K. Publications P.O. Box 605 East Aurora, NY 14052	-	Who Lives in the Igloo? Who Owns the Unicorn?
Dandy Lion Publications P.O. Box 190, Dept. GD San Luis Obispo, CA 93406	-	Connections

THE MINI-STUDY

The second component of SAGE's Tri-fold Curriculum is the mini- study. The mini-study is a vehicle in which to infuse the higher level thinking skills into content areas that are broad-based and integrate multiple disciplines into the area of study. The mini- study exposes students to a wide variety of topics in order to broaden existing interests, knowledge and experiences. It also serves to stimulate interests in topics generally unknown to the students.

SAGE employs a Content - Process - Product model in developing mini-study units. Samples are included and instructions are provided in order for you to familiarize yourself with the format for our units so you may develop your own.

Mini Study Model

CONTENT	PROCESS	PRODUCT
1. Unit Theme	1. Thinking Process	1. Problem that Product Addresses
2. Concepts	2. Skills	2. New and Unusual type of Product
3. Curriculum Areas to be covered	3. Research Methods	3. Audience
4. Extensions into other areas	4. New Techniques	

CONTENT

Content refers to the base of information or knowledge to be presented to students. Concentration is placed on concepts and generalizations within the content areas, rather than on specific facts to be learned. Content may include issues (helpful and harmful effects on the environment), problems (life in the future), or themes (communication, courage).

Issues:
Problems:
Themes:

PROCESS

Process refers to the thinking strategies that are emphasized. These thinking strategies can be categorized under the major headings of inquiry, creativity, problem-solving and higher cognitive operations. Each major heading can be further defined as follows:

Inquiry

- observing
- experimenting
- criticizing
- evaluating

Creativity

- producing many responses (fluency)
- producing varied responses (flexibility)
- producing new or original responses (originality)
- elaborating on a response (elaboration)

Problem-solving

- defining the problem
- locating evidence
- hypothesizing
- validating
- evaluating

Using Process Verbs

Learning activities should focus in upon the development of these thinking skills and processes, rather than the collection of knowledge (information). Below you will find a list of process verbs to assist in the creation of learning activities.

- explain
- illustrate
- label
- predict
- compose
- propose
- construct
- relate
- modify
- initiate
- change
- compare
- analyze
- evaluate
- criticize
- appraise
- demonstrate
- translate
- design
- combine
- improve
- solve
- generalize
- summarize
- forecast
- imagine
- defend
- classify
- categorize
- group
- judge
- put in sequence
- identify
- show
- hypothesize
- originate
- invent
- organize
- find examples
- create
- restructure
- substitute
- contrast
- dissect
- take apart
- justify
- recommend

PRODUCT

Product refers to the final form in which information will be presented by students. It is important for students to identify ideas for presenting what they have learned. The options are unlimited: Teachers should vary student products in activities in order to stimulate and motivate the creation of new ideas.

Ideas For Student Products

Design a
crossword puzzle
game
transparency
costume
bulletin board
experiment

Prepare a
newspaper
letter

Write a
story
puppet show
play
TV program
tape conversation (interview)
riddle
new law
poem

Teach a
lesson

Construct a
mobile
musical instrument
diorama
model
comic book
collage

Paint a
scene
picture

Organize a
collection
word find
Draw a
map

Create a
mural
filmstrip
chart

What are some products that you can think of? Add them to the listing above.

This Is A Sample Of The Demonstration Plan

The unit, *Keep on Pumping*, is presented to demonstrate the use of the content, process, product model. In beginning to plan a mini-study unit, certain decisions need to be made. In making these decisions, it is of prime importance to match activities to the characteristics of the gifted population. The following chart can be used in the preliminary planning stages. The completed form illustrates the decisions made regarding the unit, *Keep on Pumping.*

Keep On Pumping

Needs of Gifted/Talented - Focus on open-ended task; integration of basic skills and higher level thinking skills; allow for in- depth learning; develop research skills and methods.

Content:

Unit Theme - Heart and circulatory system

Concepts - Role of the heart and circulatory system

Diseases of the heart and circulatory system

Outstanding doctors and pioneers in the field of heart and blood research

Curriculum Areas to be Covered:

Science: Physiology, Experimentation, Use of Microscope

Language: Etymology, Spelling, Creative Writing and Research, Decision Making

Art: Drawing, Creating Models, Cartooning

Mathematics: Measuring, Graphing

Extensions: Nutrition, Physical Fitness, Human Body as a Whole, Wholistic Studies, Comparative Studies of Animals and Plants

Process:

Higher Level Thinking Processes:

Inquiry, Creativity, Problem-Solving and the Higher Cognitive Operations

Skills:

Experimenting, Observing, Fluency, Flexibility, Originality, Elaboration, Analysis, Evaluation, Hypothesizing, Solving Problems (Creative Problem-Solving).

Research Methods**:**

Historical, Experimental and Field Research (See Independent Study component for a detailed description of each.)

New Techniques or Materials to be Used:

Collecting Data through Experimentation, Investigating New Sources for Providing Information in the Appropriate Area.

Product:

New and Unusual Products and Method of Presentation:

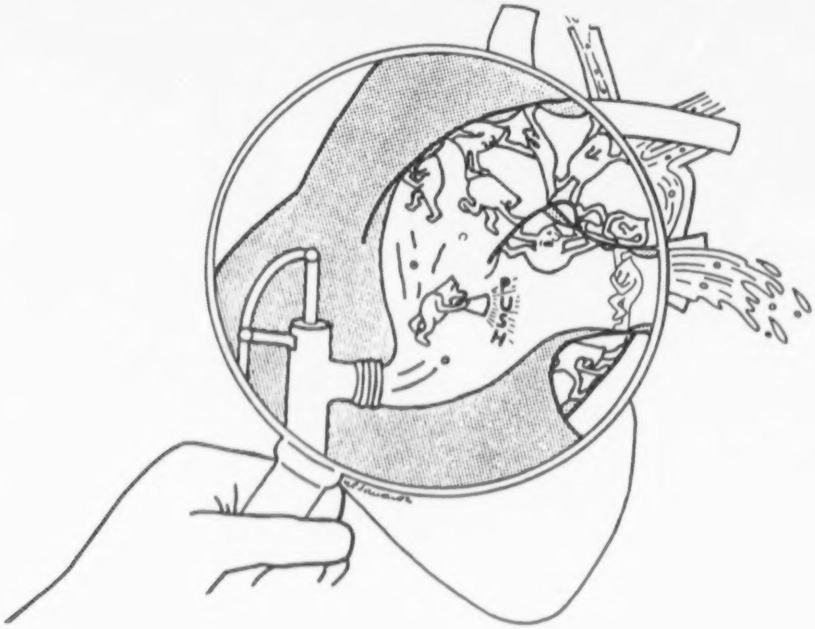
Presenting research results in cartoon form, model of the heart, book on preventative measures, film or slide presentation.

Problem that the Product Addresses:

How Can One Prevent Heart Disease?

Audience:

American Heart Association Hospital Cardiac Service Units, School Health Classes



*Note: A blank preliminary planning sheet is provided on the following page.

SAGE Preliminary Planning Sheet for Mini-Study Unit

Needs of Gifted/Talented to be addressed:

CONTENT:

Unit Theme ____

____

____

Concepts ____

____

____

____

Curriculum Areas to be Covered ____________________________

____

Extensions Into Other Subject Areas _________________________

____

PROCESS:

Higher Level Thinking Processes ___________________________

____

Skills ____

____

____

Research Methods _______________________________________

____

____

New Techniques or Materials to be Used _____________________

____

____

PRODUCT:

New and Unusual Products _________________________________

____

Method of Presentation (i.e., model, book) ___________________

____

Problem that the Product Addresses _________________________

____

Audience ____

Planning Unit

Use the chart "How Are Thinking Skills Developed?" to apply this model, using your own content. Select a specific concept you will teach during the next week. List it below.

Content:

Using the chart, decide which thinking process you wish to develop through this lesson (i.e. analysis, synthesis, evaluation). In the second tier select an appropriate process verb (i.e. chart, diagram, etc.). List the product below.

Process:

In the third (outer) tier of the chart select a product which will serve as the outcome of the lesson (i.e. chart, diagram, etc.) List the product below.

Product:

Write a behavioral objective for your lesson which includes content, process, and product.

Try one more. Select a concept and write an objective including the content, process, and product.

Underline the content. Put double lines under the process and circle the product.

In developing lessons for the SAGE units, the following format has been useful:

Unit:
Grade Level:
Title of Lesson:
Cognitive Level(s):
Skill:
Objective:
Introduction: (Motivation)

IMPLEMENTING SAGE:

DESIGNING YOUR OWN CURRICULUM MATERIALS

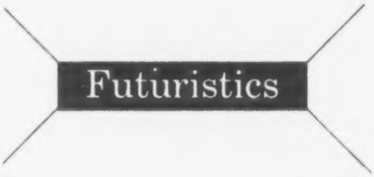
Select the topic based upon student input.

Follow the same format whether you use a SAGE unit or are developing your own mini unit.

Determine what is to be learned.

Create a key word (or words) and do a curriculum web - explode the topic with areas of possible exploration.

Once the web has been created, you will need to **delimit** the content based upon the following:



Student interest
Teacher interest
Resources
Time
What is worth knowing: the need for knowledge in the content area
Thinking skills to be focused on during this Mini-Study Unit

Once you have selected the content to be included, **brainstorm** possible concepts to be taught. The following is an example from a potential unit on buildings which can be developed with the SAGE process.

Sample concepts might include:

effects of people on buildings and vice-versa
effects of technology on buildings
personalities of buildings
messages buildings convey through sounds, voices, faces
life and death of buildings: life cycle
buildings as art forms
potential uses of buildings
effect of climate on buildings

Select and refine a list of the content objectives to be used in building the curriculum.

Example: A building is an art form.

There is a relationship between buildings and leisure-time activities.

Brainstorm and **select** specific goals to be explored for each content objective.

This can be done by posing a series of questions.

Example: A building is an art form.
What makes a building beautiful?
What functions do buildings perform?
What gives a building worth?
What gives a building unity?
How do buildings convey messages?
How do buildings convey feelings?
How does a building reflect the spirit of a society or a culture?

Once you have **listed** the questions, **select** the areas to focus on in planning the unit. Which questions reflect the goals you hope to achieve in teaching the unit?

Examine the Parameters

How much time is needed to explore the content goals?
How will the time be allotted?

Example: In planning a 12-week unit with 1 or 2 sessions per week you can order the content objectives on a weekly basis. If you allow a week for initiation of the unit and a week for closure, then ten objectives would be optimal. Some objectives may require more than one week - this can be determined by the unit developer.

Select Resources and Order Materials that will be needed.

Select which higher level thinking skills you wish to focus on developing through the content of this unit. Build the thinking skills into the unit framework using the thinking skills development of portion of this manual.

Utilize the SAGE Mini-Study process to develop the specific lesson plans.

Structures and Forces

Sample of a lesson using SAGE Mini Study Process

Grade Level: Adaptable 1-6

Title of Lesson: Studying the effect a building has on its visitors.

Cognitive Level(s): Analysis, Synthesis

Thinking Skills: Cause and Effect - Flexibility, Originality

Objective: Students will design a brochure which advertises how a museum influences the way its visitors feel or think as they discover the treasures within the museum.

NOTE: content (______), process (======) and circle the product (○).

Introduction: (Motivation) Familiarize students with the book, From The Mixed Up Files Of Mrs. Basil Frankweiler which takes place in the Metropolitan Museum of Art. "Become the Metropolitan Museum of Art. Design a brochure that advertises how you influence the way your visitors feel or think as they discover your treasures."

Once the specific thinking skills to be taught have been determined, the unit developer can put the lessons together as a mini-study unit. At this point, the Independent Study component needs to be considered. Which research skills are to be developed during this unit? Use the Independent Study Section in the SAGE Training Manual as a guide. An example of a way to integrate skills into the content of the unit follows:

An aspect of the mini study which will foster the development of research skills is to have the students utilize individual research folders prepared by the teacher related to the topic. For example, in teaching the general concept, architects have effects on people and society, the students can use the individual folders or books, magazines and other primary source materials to locate the following 3 questions about a selected architect:

> How did he/she get the ideas for the buildings?
> What kinds of materials did he/she like to use? Why?
> How would he/she define a beautiful building?

The student then participates in a panel to share his/her answers with the group. The "product" for this lesson is the verbal presentation of knowledge via a panel discussion.

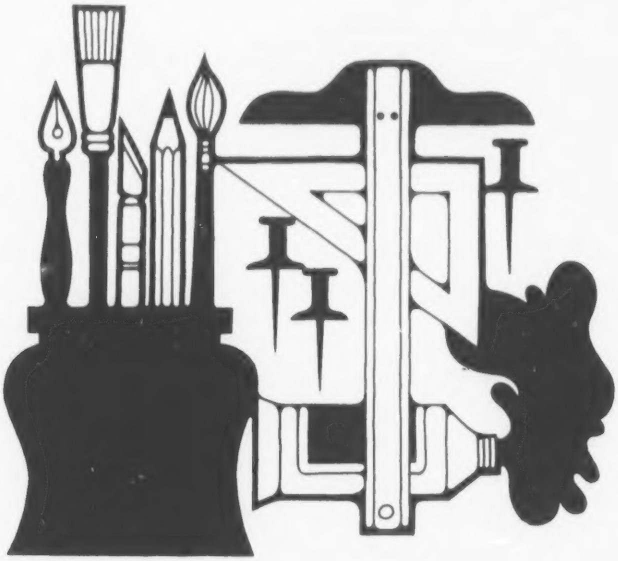
This type of activity can be used with any content area. During the teaching of the Inventions Unit the students were asked to read a biography about a famous inventor and answer the following three questions:

What did he/she invent?
How do you think he/she got the idea for the invention?
What types of things would the person invent for our society today?

This type of activity also provides a mentor through another format, the printed word. It is also possible to include people who work in areas related to the content areas whenever possible. You could follow-up a student-reporting panel with a panel of actual architects.

Students need guidelines, time and encouragement for the product development component (Independent Study) of the mini-study unit. Using the guidelines for pacing provided in the Independent Study Section of the training manual, students can successfully design an appropriate product. The audience will vary for each unit. Plan to have a product display for the school community to highlight at least one unit per year.

Planning sheets, located in the appendix will assist you in developing a mini unit using the SAGE process.



SCOPE AND SEQUENCE

The SAGE Program developed a unique format for servicing students in grades 1-6 when SAGE became a town-wide program in 1983. Themes or issues form the basis of the mini-study units which are generally designed to be taught over a 12-week period in the resource facility. Additional materials related to the units are periodically developed for the regular classroom teacher. SAGE teachers present integration lessons which focus on developing thinking skills (Renzulli's Levels I & II) in the regular classroom. Thus, a student in the SAGE Program is generally involved in three mini-study units each school year. Parents receive an overview of the units at the beginning of the school year.

This organizational framework enables all five SAGE teachers to share and develop resources and lesson ideas at their weekly staff meeting. The types of activities are designed to meet the ability and maturity levels of the students. For example, more emphasis is on the teaching of specific thinking and research skills for primary level students. The intermediate grade students are more involved in the direct application of these skills through simulations, debates, etc.

It is important to note that educational service providers who adopt the SAGE Program have the flexibility to utilize the SAGE Tri-fold Curriculum to best meet the needs of their students. The Implementation Guidelines in the Training Manual have reviewed the suggested procedure for utilizing the Tri-fold Curriculum in any of the administrative designs. The length and number of mini-study units taught will vary with the around of program time.

Scope and sequence forms have been designed to assist educational service providers with record-keeping procedures. These can be used by the teacher servicing the gifted/talented students to record the content (concepts) presented, processes utilized, and products developed. The teacher can record individual progress for each student in addition to documenting the content, processes and products he/she has introduced.

Irving Sato of the National/State Leadership Training Institute on the Gifted and the Talented advises program planners to develop courses by selecting an over-arching theme which can be utilized by several grade levels, ideally K-12. A course of study for each grade level with specific mini-study units would be designed to relate to the over-arching theme. (Sato, 1985)

The SAGE format is similar to this. The teachers poll the students in the spring regarding the course of study for the following school year. For example, the theme selected for 1985-1986 was Survival. The first mini-unit was on animal survival and the next was on human survival via economics.

The **Content** Scope and Sequence forms follow the format presented in the Mini-Study section of the training manual. The title of the unit is listed, and then any issues, problems or themes covered in this unit are listed. Specific concepts taught (i.e. following the suggestion of one major concept per week) are listed and comments can be made under the grade level ranges. Using the SAGE unit of Animal Survival, examples are as follows:

Mini-Study Unit:	**Animal Survival**
Issues:	Should land which might contain oil or copper be developed or should it be preserved as a wilderness area?
Problems:	The food chain is dying.
Themes:	Survival
Concepts:	Animals are inter-dependent (Gr. 1-6) Certain species of animals are currently endangered (Gr. 1-6)

The focus of the **process** scope and sequence needs to be in the following four areas for the gifted and talented according to Sato. (Sato, 1985)

- Creative Thinking and Production
- Critical Thinking
- Independent Inquiry and Research
  - Independent Study/Skills
  - Inquiry Skills
  - Research Methodology
- Affective Considerations

Each of these areas needs to be broken down into sub-skills. To do this, ask the question, "In order to develop the creative thinking process what skills must they acquire?" For example, one of the skills of the Productive Thinking Model is Original Thinking. List the sub-skills with the process verbs used in the lessons to teach these skills. On the form under Process---Creative Thinking would be listed. On the left side list the creative thinking skill(s) as you teach them, followed by the sub-skill and the process verbs. For example:

Original Thinking

1.1 Brainstorm
    List
    Collect
    Add
    Gather
    Describe
    Enumerate

1.2 Invent
    Create
    Design
    Formulate
    Originate
    Develop

Using the following Key: I = Introduce, which indicated at what grade level the skill was first presented to the child; **D** = Develop, at what level the skill is being developed; and **M** = Master, which means that the student has met certain technical standards. Skills such as inventing will always be at a developmental level, i.e. has anyone "mastered" the process of inventing? It is suggested that three to five skills be listed for every process, using the same format for listing the sub- skills. (Sato, 1985)

The role of the **Product** Scope and Sequence chart is to encourage the development of versatility. The products are categorized as to Verbal--Written or Spoken, or Non-Verbal; Media, Visual Arts, Kinesthetic, or Performing Arts (dance, drama, music, etc.) (Sato, 1985) An example of a Product Scope and Sequence follows:

Product: Verbal, Written

Expository Writing
1.1 Log/Journal
1.2 Autobiography
1.3 Biography
1.4 Summary
1.5 News Article
1.6 Research Article

Persuasive Writing
1.1 Letter
1.2 Critical Analysis
  Movie Review
  Book Review

The Scope and Sequence forms enable the teacher(s) to maintain continuity in program planning to meet the needs of the gifted students. The material on pages 41-43 and in the Thinking Skill Development Section will assist teachers with ideas for content, processes, and products to be used in teaching the gifted and talented.

Guideline for Developing a Scope & Sequence

Suggested Thinking Skills for Grades 1-6:

Grade 1

Introduction to fluency - brainstorming
Figural patterns
Categorizing/classification
Attributes
Sequences
Figural analogies
Flexibility of thought
Originality of thought
Elaboration of thought

Grade 2

Patterns
Sequences
Figural analogies
Verbal classification
Fluency of thought
Flexibility of thought
Originality of thought
Elaboration of thought

Grade 3

Cause and effect relationships
Open-ended problems
Deductive reasoning
Verbal analogies
Fluency, flexibility, originality, and elaboration of thought.

Grade 4

Introduction to syllogisms
Inferences
Relevant information
Deductive reasoning
Creative problem-solving
Verbal analogies
Fluency, flexibility, originality, and elaboration of thought

Grade 5

Syllogisms
Deductive reasoning
Creative problem-solving
Analogies
Critical thinking
Fluency, flexibility, originality, and elaboration of thought

Grade 6

Deductive reasoning
Creative problem-solving
Reasoning by analogies
Critical thinking - debating
Fluency, flexibility, originality and elaboration

Sample

__________________ SCHOOL DISTRICT

Content Scope and Sequence

Mini-Study Unit:

Issues: Should land be reserved as a wilderness area:

Problems: The food chain is dying.

Themes: Survival

Concepts	Grade Level Ranges		
	K-3	4-6	7-8
Animals are interdependent. Certain species of animals are currently endangered.			

Sample

________________SCHOOL DISTRICT

Process Scope and Sequence

Key
I=Introduce
D=Develop
M-Master

PROCESS: Creative Thinking	Grade	Level	Ranges
	K-3	4-6	7-8
Original Thinking			
1.1 Brainstorm	I	D,M	
List			
Collect			
Add			
Gather			
Describe			
Think Tank			
1.2 Invent	I	D	D
Create			
Design			
Formulate			
Originate			
Develop			
Attempt			
Experiment			
Try			

Sample

____________SCHOOL DISTRICT
Product Scope and Sequence

Key
I=Introduce
D=Develop
M=Master

PRODUCTS: Verbal: Written	Grade	Level	Ranges
	K-3	4-6	7-8
1. Expository Writing			
1.1 Log/Journal			
1.2 Autobiography/Biography			
1.3 Summary			
1.4 News Article			
1.5 Research Paper			
2. Persuasive Writing			
1.1 Letter			
1.2 Critical Analysis			
Movie Review			
Book Review			
3. Entertaining Writing			
1.1 Poetry			
1.2 Short Story			

Independent Study

The third component of the SAGE curriculum, independent study, allows students the opportunity for in-depth learning of a self-selected topic. As students are introduced to the open-ended, broad-based tasks presented in the mini-study units, a particular area of interest is identified. Students are then able to design a project based on their topic of interest. Asking questions, selecting resources, conducting research and developing products that use new materials, techniques and forms are key elements to a successful independent study experience.

Definition

Independent study is an individualized process of studying a subject or topic. An independent study program should meet students' needs and interests and may originate from any of the following:

Self-selected studies: Students individually select a study topic based on their own interests or needs.

Related studies (spin-off studies): Students select a topic of study, often having been exposed to a subject through teacher-directed lessons.

Curricular studies: Students select a topic of interest from a list of topics the teacher has prepared based on the subject matter to be studied by the entire class. Children may work by themselves or in a small group setting.

Purpose

An independent study program allows students to actively acquire knowledge relevant to life situations through use of independent study. Students should become increasingly self-sufficient learners and develop independence.

This process includes:

Selecting topics of interest.
Questioning techniques - (teaching development of).
Assessing personal knowledge of topic.
Developing appropriate research skills.
Executing a plan to achieve goals and objectives.
Evaluating and assessing their work.
Finding an outlet to communicate their knowledge.

The independent study gives students the framework for making choices and decisions about their learning. It teaches them how to communicate their newly attained knowledge. Also, the independent study encourages the teacher to become a facilitator, listener and clarifier.

Objectives

The goal of the Independent Study Program is to encourage and prepare the individual student working on his own initiative, to undertake, to direct and to successfully complete his/her own study activities in areas which are of interest and value to him. Behavioral objectives of the independent study are:

> Students will select a topic of interest by using an interest inventory selection process.
>
> Students will narrow down a broad topic of interest into a more specific area.
>
> Students will assess what they already know about the topic selected.
>
> Students will develop appropriate questioning techniques by using basic question starters, i.e. why, when, what, where, how, who. Students will then break down open-ended questions into answerable questions.
>
> Students will specifically state objectives that they wish to solve (finding answers to their questions).
>
> Students will learn appropriate research skills in order to locate, gather, organize, process and communicate information (includes learning how to use the library).
>
> Students will learn various processes to carry out their project plan.
>
> Students will synthesize their knowledge into a final product/products.
>
> Students will learn to judge their own work, as well as the work of others, by using formal evaluation techniques.
>
> Students will find an appropriate outlet/audience for their work.

Climate

The role of the teacher, one of the facilitators, is clearly outlined in this section. Leading students to the development of useful organizational skills, structure, styles and strategies to reach an end result is a major objective. Equally important is the display of student curiosity about a wide variety of topics and the follow-up with self-initiated study in the same area. The means by which to attain these goals are contained herein.

It is the goal of all teachers to foster a climate conducive to independent learning and to encourage the continual growth of each student toward rewarding self-directed learning experiences. Since many such experiences are essential before the student undertakes a truly independent study, a series of specific activities have been designed to promote and reinforce the skills which lead to independence.

Among the many factors which contribute to successful independent learning activities are the following:

Strong motivation...the spirit of inquiry
Positive self-concept and attitude
Sufficient maturity and self-discipline
Well developed study habits and skills
Successful interaction with peers
Readily available resources and materials

Identifying Interest Areas

The following types of questions may help stimulate interest in topic areas:

THINGS I've always wondered about are:
THINGS I know most about:
THINGS I know but want to find out more about:
What I would like to do when I grow up:
A place I would like to go:
I would like to spend my time doing:
I like looking at:
I like reading about:
A person I would like to talk to is:
What are things you collect?:
What do you do best?
What famous person would you most like to meet?
Things I like to make are:
If you could spend a day being someone else, who would you be?
T.V. specials I find interesting are:

INQUIRY PROCESS

Problem

Analysis

Hypothesis

Investigation

Conclusion

Communication

Evaluation

What do I want to know?
What do I know/not know about the problem?
What do I think the answer is? statement.
Auditory
Visual
Smell

Learning Styles

Manipulatory
Oral
Taste
What is the answer based on my investigation?
Verbal oral
Sound
Three-dimensional

Communication Styles

Verbal written
Movement
Color Line
Symbols
Peers, self, teacher-student, etc.

The Inquiry Process should help the student be persistent in learning; look for objectivity, reason, and logic; and remain open-minded until evidence is in. Learning to use this thought process opens the world to the student for independent study. The teacher can become a facilitator instead of a "giver of knowledge".

Teacher Guidelines For Independent Study

Teacher Role as an Advisor for Independent Study

Think of yourself as:

An *identifier* of interests - the students' interests and your own area of interests and expertise as they can relate to the students.

A *resource person* - human and material resources provide the basic "curriculum" for independent study.

A *facilitator* - one who helps things to happen so that the gifted student can create his/her own meaningful independent study.

A *questioner* - questions provide the basic teaching-learning strategy for independent study.

A seminar or group *discussion leader* - one who sparks independent study students to report and exchange ideas and information and to critique each other.

Leader of a group research project - one who devises a group research project with a topic each student can explore independently and share results.

An *instigator* - one who devises ways for students to share their findings.

A *trainer* of skills - one who enables the student to pursue his/her interests with the necessary skills and report the results with the appropriate skills.

Approaches to Fulfill the Teacher-Advisor Role

The approaches flow into each other, therefore the teacher-advisor at times is acting simultaneously in several capacities. The teacher-advisor can as:

- An *Identifier of Interests* -

  Through questions and surveys, help the student to find, clarify and articulate his/her interests and stimulate mutual interests between teacher and student.

- A *Resource Person* -

  Finds resources in his/her own collections, spots items in newspapers, is alert to resources in the community pertinent to independent study topics.
  Surveys faculty members to discover areas of interest and expertise pertinent to topics.
  Surveys parents of students for the same purpose.

Taps all of the above to participate when relevant in an independent study project.

Develops in students an enthusiasm for locating resources "anywhere and everywhere".

- A *Facilitator* -

Brings together the resources of special importance to individual students to enable them to select among them and pursue on their own; help "create a more creative individual".

Establishes a network of people to enhance the student's development and progress, if needed, during the time of creative individual pursuit when the anxiety level often builds: classroom teachers, guidance counselors, social workers, parents and others may be contracted for network.

- A *Questioner* -

Through questions sharpens the student's thinking skills, stimulates the imagination, challenges the student to reach new horizons for exploration, and enhances the student's awareness of his/her own (at times) unconscious questions and interests.

Enables the student to frame questions and realize that one question leads to another.

- A *Discussion Leader* -

Creates a structure, time and atmosphere for students to exchange ideas, interrelate concepts, extrapolate from other areas what is pertinent to their own, enlarge their perspectives, develop an ability to critique, conflict and debate - all necessary components for creating breadth and depth through the independent study style of learning.

- A *Leader of Group* Research Projects -

Creates topics which are broad but appealing to the students as a whole and provides the opportunity for individual research under the general topic (ex. a study of controversial heroes), and leads group discussion on a regular basis with presentation of individual reports that result in group conclusions for the total study.

- An *Instigator* -

Makes arrangements for student presentations in classrooms when appropriate. For example, reports on facets of the French culture to a French class, demonstrates computer independent studies to a computer class, discusses biographies of authors in an English class studying literature by those authors.

Sets up displays of student projects for open house activities; submits student papers to appropriate publications and interested organizations; arranges peer teaching opportunities where one student's expertise from a study can help another student.

Structures time, place and audiences for student panel presentations which reveal expertise on subjects researched.

Organizes "club" activities for gifted students and other students in the school to share their interests.

Guides students to independent studies which result in products beneficial to real audiences. For example, a study on effects of pollution, which might serve an environmental group for a pamphlet; the independent study would involve the students in the same processes as the professional environmentalist.

- *A Trainer* -

  Trains and instills in students skills listed in this module pertinent for in-depth research.

(**Note:** Independent study enables students to build confidence and expertise in specific areas upon which they can continue to build in future years; most significant sharing of independent study work may not come until later in a student's adult life, exemplified by a student now designing real buildings whose long- term independent study in a G/T program was architecture. Sometimes similar to pure research among professions, independent study may not offer practical, tangible products immediately.

Teaching Independent Study Skills

Definition:

Independent Study implies that the individual student can undertake an organized inquiry or a defined creative endeavor, either of which is self-motivated, self-directed, and self- evaluated.

Skills implies any and all tools which the student may use in pursuit of his independent objective.

Analysis Of Approaches And Skills:

Primary Skills and Approaches
Subsidiary Skills
Media Skills
Evaluation Skills

In his/her effort to develop the independent learner, the teacher should be constantly alert to the interaction of the approaches listed above.

Delineation Of Skills And Techniques:

Primary Skills and Approaches (Teaching for Independence)

Focus

Help student to determine a specific question (Encourage student to choose his/her own question).
Insist that the student limit his/her focus to the question which he/she seeks to answer.

Organization

After student has posed his/her own question, the student will need help in organizing the project and in **planning his time.**

Completion

The student needs help in meeting his/her own deadlines to complete the project. Student interaction is recommended.

Subsidiary Skills: (The tools which the independent learner may need)

- Tools for Library Research
  - Card catalogue
  - Readers' Guide
  - Reference materials
  - Note-taking
- Tools for Field Research
  - The hypothesis
  - The survey
  - The questionnaire
  - The presentation of results
- Tools for Experimental Research
  - Problem-solving techniques
  - Experimental approaches
- Tools for the Creative Project

Skills and materials which the student would use in relation to his/her goal. *Example:* If the student plans to write a short story, compose a song, or design a house, the teacher must help him/her to assemble sources and materials which will aid him in successfully completing his project.
"Limbering Up Exercises" - teaching flexibility and fluency.

Media Skills:

Selecting the Appropriate Media

The teacher can aid the student in selecting the medium or media which will be most appropriate for presenting the results of his/her research.

Using Media Effectively

Once more the teacher should guide the student in using his chosen media effectively. The written paper may be adequate; however, today's child should be encouraged to explore possibilities of contemporary media to present the results of his endeavor. Tapes, films, slides, etc. should be considered.

Evaluation Skills:

Judging Objectively - a very difficult problem for adults as well as children. Can we help them to examine their own efforts?

Developing Criteria for Evaluating - can they learn a basis for evaluating independent efforts?

Accepting Constructive Criticism - again, a challenge to students and teachers.

Conclusion:

If constructive attitudes toward independent study projects can be developed, sophisticated and creative independent endeavors may be undertaken at each level of the student's education. Ultimately, he/she may find his/her own reward in the satisfaction of his/her own research for knowledge.

Conducting The Study

Identify a topic to be investigated by the class, a group, or an individual student.

- Discuss present understandings and beliefs about the topic.
- Discuss what is not known and needs to be known.

Make a statement about the topic in the form of a hypothesis. This statement will be accepted as the student's best belief, whether right or wrong.

Begin investigations and study.

- Find evidence that proves hypothesis correct.
- **Also** find evidence that proves hypothesis incorrect.
- Use as many learning styles and thinking processes as possible.

Make a decision concerning validity of hypothesis in light of the evidence found that proves and disproves it. Don't be afraid to change opinions about first belief.

Communicate the study to the class in as interesting and personal way as possible. Use skits, models, charts, paintings, panels, debates, notebooks, bulletin boards, mobiles, as well as written or oral reports. Use as many communication styles as possible.

Evaluation of total procedure:

- Quality of product and validity of process used.
- Depth of study made by student.
- Interest of topic and means of communication.
- Practicality of study and product.
- Degree to which study stimulates further learning.

OUTLINE

Types of Independent Study

1. Research-centered Study
    - A. Library Research
    - B. Experimental Research
    - C. Field Research
2. Creative Independent Study
    - A. Creative Writing
    - B. Music
    - C. Art
    - D. Films

Methods And Materials:

Students will undertake a practice project in one of the area outlines. This practice project will be undertaken step by step under the guidance of the participating teachers. From selection of topic to completion of results, the project will be discussed and organized with teacher assistance. No grade will be assigned for this project; rather, each student's success in organizing and completing his project will be discussed with the participating teachers.

Program teachers and other participating teachers will use team techniques to implement this program.

Learning Activities

I. Practice Projects in Research-centered Study

A. *Library Research*

1. Orienting students to the library
2. Introducing students to research skills
3. Providing in-depth instruction in the uses of library facilities
4. Outlining research procedure
5. Selecting and limiting area of research
6. Assisting students in finding sources, note-taking and skills
7. Instructing students in organizing results of research
8. Completing practice project
9. Evaluating the project

B. *Experimental Research*

1. Orienting students to scientific method and laboratory techniques
2. Experimenting
   a. controls
   b. observation
   c. analysis
   d. inferences
3. Drawing conclusions
4. Reporting results
5. Evaluating the project

C. *Field Research*

1. Orienting students to field research
2. Selecting the question
3. Planning the approach
   a. sampling procedures
   b. interview procedures
   c. questionnaire organization
4. Analyzing evidence
5. Presenting the results
   a. graphs and charts
   b. tapes or photos - other evidence
6. Evaluating the project

II. Creative Practice Project in Independent Study

A. Orienting students to creative project

B. Selecting individual interests, goals and media

C. Analyzing skills needed

D. Selecting assistance from various competent persons
(such assistance may come from the community)

E. Organizing the project

F. Presenting the results

G. Evaluating the project

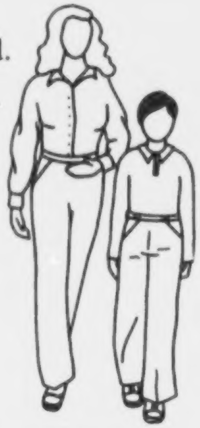
Walking Students Through The First Independent Study

After having students select an independent study project, meet with individuals and groups.

Each child is given an independent study workbook.

The various stages of the specialty are discussed and illustrated.

- Note-taking
- Outlining
- The display
- Oral-visual reporting



Samples that illustrate each of the stages are displayed.

- Rough notes
- Outline
- Pictures, graphs, charts, maps, models

The teacher, by following the stages discussed in the following pages, can construct the material needed for this demonstration.

NAME ______________________________

SPECIAL INTEREST PROJECT GUIDELINES

1. Select your topic ______________________

Due ____________
Accepted ____________

2. Make up ___ questions you would like answered about your topic.

Due ____________
Accepted ____________

3. Use at least ___ different references related to your topic. You may use books, magazines, newspapers, filmstrips, records, personal interviews or other references.

Due ____________
Accepted ____________

4. Read about your topic, looking for the answers to your questions. Make a separate card for each question, adding notes as you find answers. Write at least ___ sentences for each question.

Due ____________
Accepted ____________

5. Make a list of ___ vocabulary words and meanings specifically related to your topic. Use your references to select words and definitions. Arrange the list in alphabetical order. After each meaning, write a sentence which uses the word to help explain your topic.

Due ____________
Accepted ____________

6. From your notecards, rewrite (in your own words) the answers to each question in one or more paragraphs. Use a question for the heading of each section or page.

Due ____________
Accepted ____________

7. Write a story, play, letter, riddles, crossword, poem or some original writing related to your topic.

Due ____________
Accepted ____________

8. Select an experiment, project or other activity for presentation to the class. List the steps taken to complete this activity which relates **specifically** to your topic.

Due ____________
Accepted ____________

____

(type of activity selected)

9. Prepare to **teach the class** about your topic.

   A. Make a one-page ditto of important information.
   B. Practice the activity you plan to present.
   C. Write a quiz with about ____ questions to give to the class.

Due ____________
Accepted ____________

10. Make a book about your topic. Proofread and rewrite all work. (Pages could be cut into a shape related to your topic.)

Due ____________
Accepted ____________

   A. Cover with title, class, name and date.
   B. Vocabulary in alphabetical order (item #51).
   C. Questions and answers in paragraph form (item #6).
   D. Original writing (item #7).
   E. Steps for activity (item #8).
   F. Copies of information and class quiz (item #9).
   G. Bibliography (to list references, use the bibliography guidelines provided).

Due ____________
Accepted ____________

11. Special Project Presentation to the class

(Correct and return quizzes same day.)

Due ____________

Teacher's Comments ____
____
____

Student's Comments ____
____
____

Independent Study

	Pupil Check	Teacher Check
Note-taking Questions completed		
Changed to statements or phrases		
Placed each statement or phrase on the top line of a sheet of white paper		
Read widely on topic		
Numbered or used a dash for each note		
Completed note-taking		
Outlining Used each statement or phrase as a main topic		
Used the next most important ideas under each statement or phrase as sub-topics		
Used the facts that tell about the sub-topics as details		
Completed outline		

	Pupil Check	Teacher Check
The Display Made a list of all possible display material		
Made display material covering important points		
Printed important ideas and words on cards		
Printed on back of display material information needed in talking about it		
Completed display material		
Oral-visual Report Selected from outline information needed to tell about subject		
Jotted notes on 3 x 5 index cards		
Selected visual material from display to go along with oral report		
Worked visual material into the oral report		
Completed a summary		
Practiced giving the report at least three times		

Suggestions for Conducting Independent Study

Note-Taking

During the first two meetings with students, go over in detail with them the steps they should follow in note-taking. The following instructions are helpful for note-taking, and are discussed at this time with the student.

Make up a series of general questions that you will answer about your subject. Such questions are:

Where is it located and what is its size?

How do the land features affect the lives of the people?

How does the climate affect the lives of the people?

How do the people in the village live?

How does life in the city differ from life in the village?

What are the mineral resources of the region and how well are they developed?

How well developed are the transportation and communication systems of this region?

How well developed are the farming and ranching of this region?

What are the problems faced by this region today?

Change each of these questions into statements or phrases. Such statements or phrases are (if the subject was a region in a country):

Location and size.

Ways land features affect the lives of the people.

Ways climate affects the lives of the people.

Life in the villages.

Ways life in the city differs from life in the village.

Mineral resources and their development.

Development of transportation and communication.

Development of farming and ranching.

Problems faced by this region today.

For each statement or phrase use a sheet of lined paper.

On the top line of each sheet of white paper write one statement or phrase as the heading.

Read widely on your subject.

As you find information that goes with one of the headings, write this information, in your own words, under the heading it goes with.

Add new headings as new questions about your subject come up.

Take your notes in phrases or short sentences.

Number or put a dash before each new note.

Skip a line between each new note.

Take your notes neatly. It will do you no good to take notes now you cannot read later.

On a separate sheet of paper, keep the following information on each source used:

> Name of source
> Who published it
> Where it was published
> When it was published

Some children may experience difficulty in developing general questions pertaining to their subject. The following procedure is helpful:

> Divide children into groups of three or four.
>
> Arrange for a secretary in each group.

Have the team members contribute types of questions that could be asked about each topic.

> Have the teams share their questions with each other.

The children, after completing their statements or phrases and putting headings on the top of pieces of lined paper, now collect some of the material they will need to take notes from.

> The child checks to see what information is available in the classroom.
>
> The child also visits the school and town library to see and collect what material is available.
>
> The child writes for free or inexpensive material. (At times this material is not available or the letters are not answered. The pupil should not be too dependent on this source.)
>
> The child checks to see if there are people in the community who have special knowledge about this subject.

Books are not the only source a child should turn to in doing his research. Magazines such as the *National Geographic* and *Holiday* offer a wide range of information. A visit to the school and town library is essential. The town librarian can assist the child in the use of the card catalog and even show him how to use a periodical index.

It is not wise to assume that all children can find the information they need, even if it seems readily available. A child who has difficulty using a table of contents or an index will need the teacher's help in developing these abilities before he can do successful research.

While there are many fine children's encyclopedias available, in most cases they lack depth. The use of these books should not be discouraged, but neither should they constitute a major part of the child's research.

It is necessary to encourage the child to re-read his notes from time to time so that he may avoid re-writing the same information again.

As the note taking is to be done partly at home, the pupil must plan in advance what materials will be needed each evening. It is a good idea to check daily with the child to see that he has suitable materials at home.

By daily checking the child's progress on his project, the teacher gets a clear idea of how well he is doing and can help the pupil in areas where he is having difficulty. This daily checking helps to avoid last minute disappointments.

Outlining

After the child has completed his note taking, he has a large amount of disorganized material on his subject. In this next stage he gives organization to his information by making an outline.

In this third meeting with students have the students bring with them their independent study workbooks and their notes.

Each child takes his notes and using the headings for each topic, arranges his/her notes according to the directions specified in the independent study worksheet. Discussion about main topics and sub-topics should take place, as well as samples provided.

Preparation and Use of Visual Material

After the child has completed organizing his material he is faced with the problem of how to present. He probably has enough information to make a one- or two-hour oral report. Generally it is difficult for a child making an oral report to hold the attention of his classmates for more than five minutes. The problem is solved in two ways:

He prepares material that will make his oral report also a visual one.

He prepares display material that can be examined by his classmates after his oral-visual report.

Ask the children at this point to go through their outlines and make a list of all the places where visual material would be effective. Provide examples of visual displays, including graphs, charts, mounted pictures, cards, drawings, filmstrips, brochures, etc. Here is another place where children working in teams can assist each other in discussing and listing various kinds of visual material.

The child should:

Plan how his time at home/school will be used.

Arrange to have suitable materials to work with at home.

Daily checking of the pupils' work during the construction of the visual material is not practical. The display becomes too bulky to be moved easily, thus hampering a teacher's ability to check samples of the pupils' work.

The Oral-Visual Report

With notes taken, outline completed, and display assembled, the pupil is now ready to put together his oral-visual report. At this meeting, go over with the pupils the information presented in the independent study workbook, dealing with "Organizing for the Presentation."

Much of the success of your report will be decided before you say your first word to your audience.

How thorough was your research?

How at ease are you with your subject?

If you are still at the, "I will have to read every word when I report," state, your knowledge of your subject is rather slight.

Equally bad is memorizing your report. This is, in a way, the same as reading it from your mind.

It is important that you know your subject so well that you feel as much at home with it as you do riding your bicycle.

In short, know your subject.

You will know much more about your subject than you will have time to report.

Select those items that seem most interesting and important to include in your oral-visual report.

Allow your display to tell about the rest of your specialty.

From your outline select those items your report is going to deal with.

> Jot these items on some three-by-five index cards.
>
> This will allow you some notes to refer to as you present your oral-visual report.

Select from your display material (graphs, charts, maps, mounted pictures, models) those items that best go with your subject.

Practice giving your oral-visual report.

> Add and subtract items from your outline and display material as they seem to make clear what you are trying to say.
>
> As you practice giving your report, work in your visual material.

Select only visual material that will help you illustrate important points or highlight your report. Use visual material when words alone do not seem to make clear what you are trying to say.

Do not put all your visual material either at the beginning or at the end of your report.

> Locate the visual material in your report so that these illustrations or models are used with the words or ideas they are meant to clarify.
>
> Have the words and pictures go together.

In giving your oral-visual report, you will be either sitting or standing, facing your audience. You will undoubtedly be nervous. Do not allow this nervousness to upset you. Nervousness is normal. It means you are all "keyed up". Take a deep breath and begin.

Have a well-prepared first sentence. This will help get you off to a good start.

Look at your audience as you report.

> Talk directly to them.
>
> Do not look at the floor, ceiling, table top, or try to hide behind your notes or display material.

Try to be as relaxed as possible. Use a "chatty" delivery, as if you were describing something to a group of friends.

In presenting your report:

> Speak in a clear, strong voice so all can hear you.
>
> Speak slowly enough so that all can understand you.
>
> Hold your visual material so all can see it.

Pause from time to time to allow an idea to reach the audience.

When presenting a new word or idea, you will have to repeat this new word or idea several times if it is to mean anything to your audience. Showing a word on a card is a way of repeating the word that is not just saying the word over again.

Conclude your oral-visual report with a short summary.

Just as it was a good idea to have a prepared first sentence, it is also a good idea to have your last sentence worked out in advance.

When you have said what you have to say, then it is time to use your prepared last sentence.

Don't say another word. If you do, you might go on for another ten minutes and spoil your good report.

At the conclusion of your oral-visual report you can see how well the class has paid attention to your report.

Prepare several questions to ask the class.

Administer a short test covering the information found in your special report.

Organize your report so that it tells certain important and interesting things about your subject.

Don't try to tell everything you know.

During the question period, you will have plenty of opportunity to show how well-informed you are on your subject.

If time permits, it is helpful if the teacher can preview the first study done by each child a day or two before it is given to the class.

Suggestions as to poise and presentation can be made at this time.

Major changes should not be suggested. These changes could not be made in the short period of time remaining, and would serve to upset the pupil.

The pupil should practice giving his report three or four times before he makes his classroom presentation.

Present it to parents and relatives.

Present it to friends - not in his classroom.

The seating and reaction of the class is important.

  The children should be sitting, facing the reporter.

  The attention of the children should be on the reporter. Books and other distractions should be put away.

  If the chairs are separate from the desks, the desks can be moved to one side, allowing the audience to come closer to the reporter.

  Note-taking on the part of the audience is desirable. These notes can be used:

    During the audience's questioning of the reporter.
    During the teacher-directed question period.

The unveiling of the child's specialty should be done as dramatically as is practical.

  The child can set his specialty up before school or when the other children are in recess.

  Sheets or cloths can cover the specialty once it is set up, until it is time for the reporter to present it.

The Question Period

Following the special report there is a short five- to ten-minute question period of the reporter by members of the class. This is a most important session that can be stimulating and exciting. The children should be stimulated to ask questions that bring out in more detail the reporter's specialized knowledge. Questions that ask, "What was that date again?" or "How did you spell that word?" are of little or no value. Questions that ask, **how, when, where, why, what kind**, are more penetrating and cause comparisons to be made.

The reporter, in answering questions, must not attempt to answer questions that he does not know the answer to. He should not try to bluff, but rather he should state that he does not know the answer. If the question is of some consequence, the question could be looked up and the answer reported at some later date. The class secretary or some other appointed person could be responsible for compiling a list of all unanswered questions after the question period. The reporter could look up the answers to these questions and report his answers to the class at a later time.

Use of Team Discussion

At the conclusion of the question period the class is divided into teams of three, four or five.

The teams are heterogeneous in make-up.

Each team has a secretary.

The teams are presented with questions by the teacher and are asked to dictate their answers to the team secretary.

After the questions are answered, each team secretary reports orally to the other teams.

The other secretaries check their lists, making corrections and additions when necessary.

The questions asked at this time deal with the present independent study and when appropriate, other specialties that relate to it.

The questions might be of a listing type such as, "List each food dish eaten by the Mexicans of the Central Plateau that would be different from food dishes we commonly eat."

The questions might be elaborative in nature, such as, "What might life on the Central Plateau be like today if, when the Spanish came to conquer and settle, there were no Indians living in the region?~

The questions might be critical ones, such as, "How can the present Mexican government improve the lives of the people who live on the Central Plateau?"

Questions and problems such as these tie the special report together. Thinking skills will only be developed when the child is given the opportunity to practice these skills.

Use of the Display

At the conclusion of the class period during which the pupil specialty was presented, the reporter may then set up his display in some prearranged section of the room. The purpose of putting up the display is not decorative.

The display material is available for all to examine.

Children can be divided into teams of two or three and given problems that can be solved by using the studies that are on display.

The curriculum-related independent study can be used to culminate a unit.

The displays help to saturate the room with materials on the subject being studied.

The displays also tend to show children the extent of their progress.

Other Parts of the Independent Study

As the independent study develops within the classroom, the teacher may wish to add several additional requirements.

A short written report on one special part of the study that interested the reporter greatly. This report would be part of the display.

A bibliography that would also be part of the display.

The outline constructed early in the development of the study put into finished shape and mounted as part of the display.

Although the independent study program should be initially developed with the more able students in grades 4, 5 and 6, as the year progresses any child who can read on or near grade level can participate in the program.

Mentorship Programs

As students become deeply involved in their independent study topics, it often becomes necessary to match a child with an expert in his/her particular area of interest. Experts, known as mentors, provide first-hand experience to students in their self- selected field of study.

Mentors meet with children in, or perhaps outside of, the school setting, anywhere from one to ten meeting sessions. The guide which follows provides pertinent information regarding the organization of mentors and the planning of such mentorship sessions.

Parent/community Involvement

Project SAGE's Parent/Community Involvement - Mentorship Program is an outgrowth of the third facet of the threefold curriculum, Independent Study. As students identify specific interests, becoming first-hand inquirers, it is necessary to match a child with specialists in the field.

Almost anyone can serve as a mentor, providing that one has a high level of interest in a particular field and is willing to help a student who shares that interest. We have found many willing and able mentors in our parent population alone.

The following materials are offered as a basis in which to structure a mentorship program. Surveys should be sent, not only to parents, but to possible community resources such as local businesses, tradespeople, senior citizen facilities, etc.

Introduction

What Is a Mentor?

When Telemachus, the son of Odysseus, set out in search of his father, he was accompanied by the Goddess Athena, disguised as an elderly guardian named Mentor. It was Mentor's responsibility to help the young Telemachus travel successfully in his first adventures in the world of adults.

The Mentor Program in Framingham is designed to find "wise traveling companions" for students who are ready to explore the adult world.

Through the program, mentors can serve as role models for students who are eager to test their knowledge and skills. In return, mentors can have the satisfaction of expanding a student's world through their own.

Almost anyone could serve as a mentor. Retired people, high school or college students, tradespeople, hobbyists, and professionals are all possibilities. It is important only that a mentor have a high level of interest in a particular field, and be willing to help a student who shares that interest.

It is hoped that the working professional would guide the student in an investigation of a topic which would, in turn, generate a product worthy of sharing with a wide audience.

When Should a Student Have a Mentor?

If a student demonstrates both a strong interest in a particular area of study and an ability to pursue that interest beyond the classroom, then a teacher should suggest the possibility of finding a mentor. If the student responds positively and indicates a willingness to do the extra work necessary to prepare for a visit, then a request for a mentor should be made.

Who Initiates the Idea of a Mentor?

A request for a mentor may be made by administrators, teachers, parents or students themselves, whenever there is a need to extend the regular school program. Teachers, however, will be the main initiators since they will use the mentor program as an option for the gifted and talented students in their classes.

Once the decision is made, then an agreement must be made with the students to prepare themselves for the visit. This may involve reviewing work already done on the topic, reading for more information, making a list of questions to ask the mentor, or gathering together a portfolio of completed work.

What are the Responsibilities of the Mentor?

Mentors would have a choice of meeting once with a student, working together several times, or becoming involved in a long- term project. Most of the work would take place after school or on weekends, although some mentors may be available only during school hours.

The mentors should be the ones to set the limits of their involvement with the program. Most programs will start with one visit, and if all goes well, future visits may be discussed. While we hope long-term commitments might evolve, we feel strongly that mentors should be comfortable saying that their time is limited.

What are the Responsibilities of the Teacher?

Once a decision is made to find a mentor for a student, the teacher's role becomes that of a resource to the student. The student will probably need both encouragement and advice when preparing for the first visit and a show of interest on his or her return.

The teacher should also see that the student completes the appropriate reports before and after the visit, and keeps these and other related papers on file.

Often a series of meetings with a mentor will lead to a product which would be of interest to other students. In this case, the teacher would help the student arrange for an appropriate time and place for a presentation.

What is the Mentor Committee and How Does it Function?

The Parent Mentor Committee is a volunteer group of parents who are committed to helping the Mentor Program function. When a request for a mentor is made this group will use its contacts in the community to find an appropriate mentor.

Selecting A Mentor: first Meeting

Procedures		Person Responsible
Step 1	Fill out mentor request form. Give to principal.	Teacher
Step 2	Send permission letter home to parents.	Teacher/Principal
Step 3	When parents give permission, call Mentor Committee.	Teacher/Principal
Step 4	Mentor committee finds. Calls principal with information.	Mentor Committee
Step 5	Mentor contacted, schedule set and transportation arranged.	Parent
Step 6	Student fills out report. Gives to teacher.	Student
Step 7	Mentor contacted by phone. Brief follow-up report filled out and sent to Mentor Committee.	Teacher/Principal

Mentor contacted by phone. Brief follow-up report filled out and sent to Mentor Committee.

The Sage Mentor Program

Project SAGE, in cooperation with its Parent Advisory Board, has established a Mentor Program which matches adults in the community with students who share similar interests and skills.

It is hoped that the working professional would guide the student in an investigation of a topic which would, in turn, generate a product worthy of sharing with a wide audience.

The Mentor Program provides gifted and talented students with valuable community experience and expertise. A request for a mentor may be made by administrators, teachers, parents or students themselves whenever there is a need to extend the regular school program.

Mentors would have a choice of meeting once with a student, working together several times, or becoming involved in a long-term project. Most of the work would take place after school or on weekends, although some mentors may be available only during school hours.

Almost anyone could serve as a mentor. Retired people, high school or college students, tradespeople, hobbyists and professionals are all possibilities. It is important only that a mentor have a high level of interest in a particular field, and be willing to help a student who shares that interest.

Since the Mentor Program is a new program in Framingham, we will be seeking suggestions from all sources. In a time of decreasing resources for public education, there will be a greater need to use community resources as part of a student's education. The SAGE Mentor Program is a first step in that direction.

Mentor Request Form

Student Name ______________________________ Grade ______ ______

Teacher __________________________ School ______________________

Student's Area of Interest:

____

____

Special Considerations:

____

____

____

Kind of Mentor Sought:

____

____

____

If a mentor was available only during school hours, would the student be able to miss class?

Yes ____ No ____

Father's Name _________________ Mother's Name ___________________

Address ____

Home Phone ___________________

Work Phone ___________________ Work Phone ____________________

Teacher completes this form.

SAGE Program

Dear ________________________________,

A request has been made that your child, ____________________,become involved in the SAGE Mentor Program. Your child has shown a strong interest in _______________________ and with your permission we will try to locate a mentor for him/her in this area.

The mentor program is designed to allow students to investigate topics in greater depth than is usually possible in schools, and at the same time, to see what people in "the real world" actually do when working on a problem or pursuing a hobby.

The mentor program is currently being coordinated by a volunteer group of parents in cooperation with the school staff. We need everyone's help in making the program work.

We would ask your help in the following ways:

> While the parent mentor committee will make preliminary contact with the mentor, we would appreciate your making the final calls to set up a meeting time.
>
> Since the school cannot provide transportation, we will have to depend on you for this part of the program.

If you would like us to find a mentor for your child, please sign below and return this form to his/her teacher. Feel free to call your building principal or the SAGE staff for further information.

Sincerely yours,

- -

> I agree to have my child work with a SAGE sponsored mentor.
>
> I am willing to provide transportation.
>
> After a mentor is selected, I will call and make final arrangements for a meeting.

______________________________ ________________________

Signature Date

First Mentor Meeting: Planning The Visit

Name ______________________________
Teacher's Name ______________________________
School ______________________________
Mentor's Name ______________________________
Topic Of Interest ______________________________

How I Became Interested In My Topic

____
____
____
____

Some Questions I Will Ask My Mentor

____
____
____
____
____

First Meeting: Follow-up

My Name ____
Mentor's Name ____________________________________
Date Of Meeting ___________________________________
My Topic Is ______________________________________

****

All the things I did ____
____
____
____
____
____

****

What I would like to do next _________________________________
____
____
____
____
____

I would like to meet again with my mentor. Yes _____ No _____

Did you write a thank-you note to your mentor? ___________

SAGE PROGRAM

Dear Mentor:

Thank you for working with the SAGE Mentor Program. Since this program is just beginning, we need as much information as possible about how things are working.

Someone from the schools will call you soon to discuss any suggestions you have for us.

If you are interested in continuing to work with us, we would be delighted. Remember that you should be the one to decide the limit of your commitment, and we will always be willing to accommodate your schedules.

Thank you again for your cooperation.

Sincerely yours,

Student Contract: Mentor Program

Name ______________________ School ______________

Mentor ______________________ Grade ______________

Meeting Place ______________________ Day & Time ______________

Description of Project ______________________________

____

____

End Product and Potential Audience ______________________

____

____

____

____

Final Product Due ______________________________

______________	________	______________	______________
Classroom Teacher	**Date**	**Student**	**Date**
______________	________	______________	______________
Principal	**Date**	**Parent**	**Date**

Progress Checks: Midway Check ______________ ______________

Principal or Teacher **Date**

Final Check ______________ ________

Principal or Teacher **Date**

Comments: Use back if necessary - attach copies of any student reports.

____

____

____

The Sage Staff Administrative Summary Sheet

Student's Name ____________________ Area of Interest ____________________

Mentor Comm. Contact ____________________ Mentor's Name ____________________

Date

Mentor's Address ____________________ Telephone Number ____________________

Parent Contact ____________________ Mentor's Report ____________________

Date Date

Student's Name ____________________ Area of Interest ____________________

Mentor Comm. Contact ____________________ Mentor's Name ____________________

Date

Mentor's Address ____________________ Telephone Number ____________________

Parent Contact ____________________ Mentor's Report ____________________

Date Date

Student's Name ____________________ Area of Interest ____________________

Mentor Comm. Contact ____________________ Mentor's Name ____________________

Date

Mentor's Address ____________________ Telephone Number ____________________

Parent Contact ____________________ Mentor's Report ____________________

Date Date

Student's Name ____________________ Area of Interest ____________________

Mentor Comm. Contact ____________________ Mentor's Name ____________________

Date

Mentor's Address ____________________ Telephone Number ____________________

Parent Contact ____________________ Mentor's Report ____________________

Date Date

SAGE

MENTORSHIP PROGRAM

Date

Dear Parents and Community Members:

People who have specialties-talents, skills, hobbies or interesting experiences - can do much to enrich Project SAGE. At times volunteers are needed to share their knowledge and abilities with a whole class or to help an individual student to explore a special interest area in depth.

Please indicate below those specialties you would be willing to share with students in Project SAGE (grades K-5). Check all applicable items, adding other specialties if they are not listed. Use (H) or (W) to denote husband's or wife's specialties.

Indicate in a few words the specific nature of your specialty (e.g., "can demonstrate and teach interpretative dance: can show slides and discuss modern art: can demonstrate the baking of bread: can give talk on principles of architecture, building codes, patent law, local history, medical aspects of smoking, gum disease, etc."). Also indicate the grade level(s) for which you think your specialty is best suited. THANK YOU for your help.

____Acting and Dramatics ______________________________

____Architecture ______________________________

____Art ______________________________

____Banking and Economics ______________________________

____Business Operations ______________________________

____Salesmanship, Advertising, etc. ______________________________

____Construction and related trades ______________________________

____Cooking, Baking, Nutrition ______________________________

____Dancing ______________________________

____Foreign Language and Culture ______________________________

____Gardening ______________________________

____Government ______________________________

____History, Geography, Travel ______________________________

____Hobbies and crafts (Woodworking, collecting, inventing, hunting, jewelry making, etc.) ______________________________

____Law ______________________________

____Mathematics ______________________________

____Medicine and allied health fields ________________________

____Photography ____

____Science ____

____Writing, Publishing _________________________________

____Other, please specify ________________________________

Your Name ______________ Occupation ____________

Phone _____________

Please indicate on the following chart when you can assist students in the program.

	HUSBAND		WIFE	
	Anytime on these days	Only between these times	Anytime on these days	Only between these times
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				

Appendix A

Parent Packet:

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Material common to both Parent & Teacher Packets

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* It should be noted that the material found on pages 165 through 174 are used in **both** the parent and teacher packets. Those should be duplicated for inclusion as a dual purpose section.

Parent Packet

Dear Parents,

The SAGE program for the academically/intellectually gifted and talented, is currently being planned for the next school year. The purpose of this packet is to provide you with the necessary information in order to help you decide whether to nominate your child for testing in consideration for possible inclusion into the **resource pull-out** component of the program. The **integration** component of the program does not require nomination. This is automatically offered to all teachers/students.

Description Of Sage Services

There are two segments of the SAGE Program. One segment is referred to as **Classroom Integration**; the second segment is known as the **Resource Pull-Out**. Both programs are explained as follows:

Goal: Integration of the SAGE Program is the presentation of thinking skills and enrichment topics in the regular classroom. The focus here is not of a different learning approach but on providing enriching experiences, more to do to broaden horizons thus allowing for horizontal not just vertical growth.

How does SAGE Integration do this?

SAGE Integration provides materials and learning center ideas for classroom teachers to use with all students. For example, in a second-grade classroom studying animals as part of the basic curriculum, the SAGE teacher could provide enrichment activities that would incorporate thinking skills, the major focus of the SAGE Program.

SAGE Integration provides idea packets for classroom teachers. These packets suggest enrichment projects students could pursue after mastery of basic curriculum is demonstrated.

SAGE Integration provides demonstration lessons in which all students can participate. These lessons focus in upon a thinking skill (for example, critical thinking) and new strategies for teaching these skills. Follow-up materials are left with classroom teachers in order for them to continue on their own with students. Lessons are presented with the goals of enrichment rather than differentiation so that all students benefit. It must be remembered that the differentiation is the goal of the resource facility.

There are approximately 6-8 integration periods available per week.

Resource Pull-Out

Purpose: To provide for the special learning styles of identified students and provide a differentiated program for learning. How does SAGE Resource do this?

Train students to think about their thinking - to apply strategies to other examples by analyzing and retracing their steps of problem-solving.

To accelerate students through the presentation of more complex materials. By doing this in the resource setting students are able to remain at the appropriate grade level, rather than advancing to a higher grade level.

The resource facility presents alternative methods for completing standard tasks. Since SAGE students think at more abstract levels, different vocabulary, questioning procedures and assignments are required to stimulate academic achievement.

Assists classroom teacher by providing instruction in self-help skills to students which can be applied to the regular classroom tasks. Students become more independent in their learning and can translate concrete approaches to learning as presented in the classroom to their own "language" which is more abstract.

The resource facility allows students the opportunity to go beyond factual information, and begin to make connections between basic skills and their application to "real world" experiences. Since they master basic skills at a faster rate, the resource facility allows them to focus their skills on open-ended tasks. Open-ended tasks allow them to generate alternatives and develop divergent thinking skills. Therefore, the focus is to change from the one "right" answer to the ability to provide a wide range of possible solutions.

Motivation and achievement are dependent upon a challenging learning environment. For SAGE students this means the presentation of subject matter using strategies that allow for the gathering of information from a variety of sources, sharing of work with audiences ranging from classmates to the community, and presenting knowledge in a different way through the creation of new and unique products. These products require students to study a topic in depth and document their findings using such methods as surveying, graphing, and technical writing.

The goal of the SAGE Program is to provide different experiences in learning. In a typical classroom study of the heart and circulatory system, an assignment may require students to "Label, on a diagram, the parts of the human heart." Often SAGE students know this information or need to acquire these facts through the presentation of a more complex problem. They are challenged when asked, instead, to "Survey to discover the major causes of heart disease and graph your results." Through the use of analysis students would require the basic information of the parts of the heart and, in addition, learn about cause and effect relationships. Often students will formulate methods for prevention of heart disease which would lead to the proper workings of the heart - the interaction of the parts. These findings/solutions could not be determined through the simple task of labeling.

The SAGE Resource does not provide more tasks to busy students who finish work quickly, but provides different tasks in place of those that simply require recall.

NOTE: Students are pulled out of the regular classroom to attend the resource facility up to three hours per week.

How To Nominate Your Child

The purpose of this packet is to provide you with the necessary information and materials in order to nominate your child for possible inclusion in the program. Please follow the procedures listed below when nominating your child.

Procedures for Nomination:

> Please review the *Identification / Selection* procedures contained in this packet in order to be aware of the steps to be taken in this process.
>
> A section has been included addressing the characteristics/traits of the academically/intellectually gifted and talented, thus requiring a differentiated program. Please fill out the Parent Nomination Form and the Parent Questionnaire and return to your child's school **within one week from the time you receive this packet.**

Sincerely,

The SAGE Staff

Parent Nomination Form

Student ________________ Age____ Parent/guardian______________

School ____________________ Grade_____ Date___________________

If you wish to nominate your child for Project SAGE, please respond to the two items below:

> What skills or interests does your child exhibit that you feel are exceptional or unusual?
>
> If you feel that your child possesses many of the characteristics of the academically/intellectually advanced, please describe specific behaviors that demonstrate his/her exceptional skills and/or abilities.

Name of Child_______________
Date________________________

Parent Questionnaire

All Information On This Form Will Remain Strictly Confidential.

1. School ____________________ 2. Student ____________________

3. Sex (circle) M F 4. Grade ____________________

5. Birthday ____________________ 6. Age ____________________

7. Schools attended: City and State Date (from______to______)

____

____

____

8. Brothers and sisters:

Names	Ages

9. Describe early indication of superior ability:

____

____

____

10. Private lessons taken by child:

Kind	How long taken	Frequency

11. Child's recreational choices: ____________________

____

12. Child's membership in out-of-school clubs or groups:

____

13. Child's reading interests (favorite books - types, titles):

____

14. Amount of child's reading per week (estimate): ____________

____

15. Child's hobbies and collections: ______________________________

____

16. Child's special talents or skills: ___________________________

____

17. Describe special activities of the child at home: _________

____

18.Child's home responsibilities: _________________________________

____

19. Describe your child's attitude toward school: _______________

____

20. Child's school needs as you see them: ______________________

____

21. Describe the child as you see him/her (personality, attitudes, workhabits,etc.):

____

Teacher Packet

Dear Teachers,

SAGE, the district's program for the academically/intellectually gifted and talented, is currently being planned for the next school year. The purpose of this packet is to provide you with the necessary information to help you decide which, if any, of the children in your classroom should be tested in consideration for possible inclusion into the **resource pull-out** component of the program. The **integration** component of the program does not require nomination. This is automatically offered to all teachers/students.

Sincerely,

The SAGE Staff

Staff Nomination Form

Student ____________________ School ______________

Your Name __________________ Grade ______________

Title ______________________ Date _______________

We're looking for children in your classroom who you feel manifest superior achievement or potential for superior achievement. The following list of characteristics, while by no means all inclusive, represents traits and/or behaviors that may be observed in academically/intellectually advanced children. Keep in mind that the characteristics listed may well describe some average students, but in trying to determine those children who will best benefit from Project SAGE, consider the number of characteristics that describe a particular student, as well as the degree to which the trait or behavior may be observed.

Please place a check in the space beside the observed characteristics that are present to an advanced degree.

____ 1. Displays a great deal of curiosity about a variety of things.

____ 2. Highly motivated.

____ 3. Knows about many things of which classmates are unaware.

____ 4. Recognizes problems and cares about discovering **why**.

____ 5. Neglects daily assignments, but does well on tests.

____ 6. Generates unusual, clever or unique ideas or solutions to problems and questions.

____ 7. A risk-taker - adventurous and speculative.

____ 8. Sees many aspects of one thing: fantasizes, imagines, manipulates ideas, elaborates.

____ 9. Creative, original and inventive.

____ 10. Impatient with routine drill and repetitive tasks, but likes thinking problems.

____ 11. Mature sense of humor (puns, associations, etc.)

____ 12. Can show relationships among apparently unrelated ideas and has ability to understand complex concepts.

____ 13. Becomes absorbed in and **committed** to an activity.

____ 14. Seeks out challenges.

____ 15. Doesn't follow directions, but designs own systems for doing things.

____ 16. Shows ease and maturity in verbal expression.

____ 17. Higher level of abstraction than peers.

____ 18. Sensitivity - understands and cares about broad, human issues.

____ 19. Remembers more and retrieves from memory easier and quicker than information which has been heard, read or seen.

____ 20. Persistently pursues goals to a degree which appears to be stubbornness in some situations.

Do you _____ strongly recommend this student
_____ recommend
_____ recommend with reservation

Please list supporting comments and/or additional information.

Scale For Rating Behavioral Characteristics Of Superior Students

Joseph S. Renzulli/Linda H. Smith/Alan J. White/Carolyn M. Callahan/Robert K. Hartman

Name ______________________________ Date ____________

School __________________________ Grade _____ Age _____

Your Name _______________________ Title ______________

Directions: These scales are designed to obtain teacher estimates of a student's characteristics in the areas of learning, motivation and creativity. The items are derived from the research literature dealing with characteristics of gifted and creative persons. It should be pointed out that a considerable amount of individual differences can be found within this population, and therefore the profiles are likely to vary a great deal. Each item in the scales should be considered separately and should reflect the degree to which you have observed the presence or absence of each characteristic. Please read the statements carefully and place an X in the appropriate place according to the following scale of values.

If you have seldom or never observed this characteristic.

If you have observed this characteristic occasionally.

If you have observed this characteristic to a considerable degree.

If you have observed this characteristic almost all of the time.

Add the total number of X's in each column to obtain the "Column Total."

If you wish to comment, please use reverse side of scales.

____

____

PART 1: Learning Characteristics ________

PART II: Motivational Characteristics ________

PART III: Creativity Characteristics ________

PART I: Learning Characteristics

Seldom or Never - **S**
Occasionally - **O**
Considerably - **C**
Almost Always - **A**

___ Has unusually advanced vocabulary for age or grade level: Uses terms in a meaningful way; has verbal behavior characterized by "richness" of expression, elaboration, and fluency.

___ Possesses a large storehouse of information about a variety of topics (beyond the usual interests of youngsters his/her age).

___ Has quick mastery and recall of factual information.

___ Has rapid insight into cause-effect relationships: tries to discover the how and why of things; asks many provocative questions (as distinct from informational or factual questions), wants to know what makes things (or people) "tick".

___ Has a ready grasp of underlying principles and can quickly make valid generalizations about events, people, or things; looks for similarities and differences in events, people, and things.

___ Is a keen and alert observer: usually "sees more" or "gets more" out of a story, film, etc. than others.

___ Reads a great deal on his/her own: usually prefers adult-level books; does not avoid difficult material; may show a preference for biography, autobiography, encyclopedias, and atlases.

___ Tries to understand complicated material by separating it into its respective parts; reasons things out for himself/herself; sees logical and common sense answers.

Add Column Totals

Part II: Motivational Characteristics

Seldom or Never - **S**
Occasionally - **O**
Considerably - **C**
Almost Always - **A**

___ Becomes absorbed and truly involved in certain topics or problems; is persistent seeking task completion. (It is sometimes difficult to get him/her to move on to another topic.)

___ Is easily bored with routine tasks.

___ Needs little external motivation to follow through in work that initially excites him/her.

___ Strives toward perfection: is self-critical; is not easily satisfied with his/her own speed or products.

___ Prefers to work independently; requires little direction from teachers.

___ Is interested in many "adult" problems such as religion, politics, sex, race - more than usual for age level.

___ Often is self-assertive (sometimes even aggressive); stubborn in his/her beliefs.

___ Likes to organize and bring structure to things, people, and situations.

___ Is quite concerned with right and wrong, good and bad; often evaluates and passes judgment on events, people, and things.

Add Column Total:

Part III: Creativity Characteristics

Seldom or Never - **S**	Occasionally - **O**
Considerably - **C**	Almost Always - **A**

___ Displays a great deal of curiosity about many things: is constantly asking questions about anything and everything.

___ Generates a large number of ideas or solutions to problems and questions; often offers unusually ("way out"), unique, clever responses.

___ Is uninhibited in expressions of opinion: is sometimes radical and spirited in agreement; is tenacious.

___ Is a high risk taker, is adventurous and speculative.

___ Displays a good deal of intellectual playfulness; fantasizes; imagines ("I wonder what would happen if..."); manipulates ideas (i.e. changes, elaborates upon them); is often concerned with adapting, improving and modifying institutions, objects and systems.

___ Displays a keen sense of humor and sees humor in situations that may not appear to be humorous to others.

___ Is unusually aware of his/her impulses and more open to the irrational in himself/herself (freer expression of feminine interest for boys, greater than usual amount of independence for girls); shows emotional sensitivity.

___ Is sensitive to beauty, attends to aesthetic characteristics of things.

___ Is nonconforming: accepts disorder; is not interested in details; is individualistic; does not fear being different.

___ Criticizes constructively: is unwilling to accept authoritarian pronouncements without critical examination.

Add Column Total:

PROGRAM EMPHASIS

Differentiation vs. Enrichment

The SAGE Program resource pull-out focus must be considered in terms of **differentiation** vs. **enrichment** and **acceleration**. The definition of these program types can help clarify the major emphasis of the SAGE Program.

Acceleration refers to increasing the speed of the introduction of specific skills, thus causing them to occur sooner than expected. It is common that bright children are capable of quick-paced vertical growth in such curricular areas as mathematics and reading. As students display mastery in given skills, they can be moved on to the next level. Programs of pure acceleration require students to recall bodies of information, comprehend the material presented and apply learned facts.

Programs of **enrichment** employ methods that bring about the horizontal growth of students in subject areas. The topics addressed are made richer and are embellished upon, therefore allowing a fuller, more meaningful or more rewarding experience in the study of the content presented at the particular grade levels. Enrichment can serve as a motivating force for all students and is known to increase productivity among students whether they are gifted or slow learners.

The emphasis of the SAGE Program is placed on neither acceleration nor enrichment. The thrust focuses in upon **differentiation,** a program dependent upon alterations or modification of teaching/learning styles. While the SAGE Program does incorporate enrichment topics and the use of more complex materials the distinction lies in the presentation of curriculum in a process-oriented teaching approach. Materials are introduced at higher, more abstract levels of thinking; therefore, we strive to increase the cognitive complexity, not merely the complexity of content.

The curriculum for the gifted must be congruent with the characteristics that identify gifted children. **Differentiation** of curriculum activities must be synonymous with these characteristics. To differentiate curriculum SAGE varies not only the **cognitive complexity** but the following areas:

affective emphasis

creative emphasis

the format of presentation

duration of

introduction
direct practice
directed and independent application

degree of student involvement in planning

degree of student involvement in evaluation

evaluative methods and criteria

teaching learning materials

These options allow students the opportunity to exercise and apply abstract thinking skills, therefore learning by methods and styles matched to their specific needs. Program activities are devoted to the further development of particular intellectual skills and talents of the gifted child.

The ability to associate and interrelate concepts.

The ability to evaluate facts and arguments critically.

The ability to create new ideas and originate new lines of thought.

The ability to reason through complex problems.

The ability to understand other situations, other times, and other people, to be less bound by one's own peculiar environmental surroundings.

The primary program adjustment for gifted students is not to give them longer and more extensive assignments of the same sort given to average students. They may or may not absorb an almost unlimited supply of facts or dutifully attack the new assignments and work hard at them. They must realize the opportunity to explore larger and more important ideas.

Target Population

The training of teaching staff and parents in the selection of students in need of the services provided (in the resource pull-out program) is of primary importance. It is necessary to review characteristics of the academically/intellectually gifted and talented in order to fully comprehend the type of child to be serviced.

The U.S. Department of Education offers the following definition:

Definition Of The Gifted Student

"Gifted and talented children are those identified by professionally qualified persons, who, by virtue of outstanding abilities, are capable of high performance. These are children who require differentiated educational programs and/or services beyond those normally provided by the regular school program in order to realize their contributions to self and society. Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas, singly or in combination:

General intellectual ability

Specific academic aptitude

Creative or productive thinking

Leadership ability

Visual and performing arts

Psychomotor ability."

U.S. Dept. of Education

The SAGE Program focuses on the first two areas specified by the U.S. Department of Education.

Who then are the academically/intellectually gifted and talented? There are many characteristics and traits that are evident in academically/intellectually gifted and talented children. The listings of characteristics which follow are provided to give you a better understanding of the type of child who may need services provided by SAGE.

CHARACTERISTICS OF GIFTED AND TALENTED

Some Learning Characteristics Of Gifted Children:

Keen power of observation; naive receptivity; sense of the significant; willingness to examine the unusual.

Power of abstraction, conceptualization, synthesis; interest in inductive learning and problem-solving; pleasure in intellectual activity.

Interest in cause-effect relations; ability to see relationships; interest in applying concepts; love of truth.

Liking for structure and order; liking for consistency, as in value systems, number systems, clocks, calendars.

Retentiveness.

Verbal proficiency; large vocabulary; facility in expression; interest in reading; breadth of information in advanced areas.

Questioning attitude, intellectual curiosity, inquisitive mind; intrinsic motivation.

Power of critical thinking; skepticism, evaluative testing; self-criticism and self-checking.

Creativeness and inventiveness; liking for new ways of doing things; interest in creating, brainstorming, free-wheeling.

Power of concentration; intense attention that excludes all else; long attention span.

Persistent, goal-directed behavior.

Sensitivity, intuitiveness, empathy for others; need for emotional support and a sympathetic attitude.

High energy, alertness, eagerness; periods of intense voluntary effort preceding invention.

Independence in work and study; preference for individualized work; self-reliance; need for freedom of movement and action.

Versatility and virtuosity; diversity of interests and abilities; many hobbies; proficiency in art forms such as music and drawing.

Friendliness and outgoingness.

Traits Common To Intellectually Gifted Children:

Displays a great curiosity about objects, situations or events. Has the capacity to look into things and be puzzled; gets involved with many exploratory-type activities; is interested in a wide range of things.

Is a self-initiated student, usually needing little help in knowing what to do; starts on his own; pursues individual interests and seeks own direction.

Exhibits originality in oral and written expression. Consistently gives unusual, clever, unique responses or ideas away from the cliche or stereotype.

Has unusual talent to express himself in the arts; i.e., music, dance, drama, drawing, play activities and/or artistic expressions.

Has the ability to generate many alternatives. Seeks many directions and is flexible in thinking by going at right angles to the mainstream of thought in the classroom.

Is perceptually open to his environment. Uses all of his senses to be aware of things around him; keenly observant; alert to things that are done as well as things that are not done.

Displays a willingness for complexity. Thrives on problem situations; selects a more difficult response, solution, or problem over the easier; seeks complex asymmetrical forms compared to symmetrical forms; has a preference for "digging into" things.

Has the capacity to use knowledge and information other than to memorize, store and recall. Seeks new associations among items of information; combines elements or materials or knowledge in a unique fashion.

Shows superior judgment in evaluating things. Reasons things out; seeks logical answers; can see implications and consequences; makes decisions easily.

Is a good elaborator. Produces a variety of detailed steps; continually adds on to ideas, responses or solutions; loves to embellish materials and ideas.

Is a good guesser. Is able to hypothesize; is full of wonder about things; is a risk taker; makes good educated guesses.

Learns rapidly, easily and efficiently.

Has the ability to see relationships among unrelated facts, information or concepts.

Uses a lot of common sense; seeks the most practical approach.

Retains and uses information which has been heard or read.

Uses a large number of words easily and accurately.

Asks many questions of a provocative nature; inquisitive about knowing why instead of what; has the capacity to inquire.

General Characteristics Of Gifted/Talented Children

They see relationships earlier than their peers.

They deal at a higher level of abstraction.

They remember more and retrieve from memory more easily and quickly.

They encode and decode readily.

They function at high cognitive levels (as described by Piaget) earlier than the generality.

They are able to free themselves from the bounds of appearances into abstract thought.

They are interested in basic questions -- "What is the meaning of life?"

They want to know why they are to do certain things, and are not satisfied with "It's the rule."

They have a high level of moral judgment, but not necessarily moral behavior.

They seek out challenges.

They develop basic learning skills earlier.

Some are more mature, but there is less difference here when compared to the average.

They learn to cope, can work out ways of coping, and learn to compensate.

They are able to solve problems, especially in communications.

Due to their differences, they can become anxious about their relationships with their peers and haven't lived long enough to resolve the resultant conflicts.

Profile Of Gifted And Talented Youth

The gifted child usually exhibits superior facility for:

Language

- highly verbal
- advanced vocabulary
- reads several years above grade level
- superior communication skills
- creative manipulation of language

Conceptualization

- keen insight into cause-and-effect relationships
- highly observant
- rapid mastery of and easy recall of facts
- creative manipulation of symbols

Socialization

- outgoing and friendly
- assumes leadership roles
- well-organized sense of humor
- openness to others

Productivity

- high physical and intellectual energy level
- self-motivated to learn
- high standards and goals
- prolonged attention span

Gifted and Talented Children:

Exhibit high creative and productive thinking ability.

Exhibit general intellectual ability.

Have specific academic aptitude.

May possess highly underdeveloped potential that needs to be stimulated.

Are often socially, emotionally and physically more advanced than their average counterpart.

Often the Gifted Child is:

Rowdy.

Non-conformist.

Thought of as a behavior problem with very little future potential.

Negative to a dull classroom situation.

Unable to allow himself to reach a mediocre or less than first- rate performance.

Unwilling to attempt a response.

Rebellious and withdraws from the situation.

IDENTIFICATION

The SAGE Program has conducted an extensive review of literature and research in the identification of students and has developed a multiplicity of means to identify students.

SRA Achievement testing: Performance in Reading, Math, Language Arts

The Renzulli-Hartman Behavioral Rating Scale: A rating system which documents the degree/frequency in which certain characteristics/behaviors of the academically/intellectually gifted and talented occur in the areas of learning, motivation, and creative thinking.

The Test of Cognitive Skills - A measure designed to assess the level of aptitude attained by students. Emphasis is placed on abilities of a relatively abstract nature that are important to success in the placement of a student in the SAGE Program.

The Writing Sample, Grades 2-5

The Interview, Grades K-1 - An instrument to assess the thinking processes and flow of thought of a candidate.

Parent/Teacher Recommendations - Data is collected from all sources. Parent and teacher recommendations are given **equal** consideration.

The actual step-by-step process of SAGE's identification/selection procedures follows.

SAGE Identification/Selection Procedures

Step I - Nomination

Any child scoring a composite score in the 97th percentile or above on the SRA Achievement tests shall be included in the initial screening.

Any child, who functions at a consistently high academic level as judged by his/her teachers, may be nominated as a potential candidate for this program.

Teachers, principals, guidance counselors and administrators may nominate pupils who exhibit the potential for developing academically, but who have not scored well on achievement tests or overall academic functioning. Students who are bilingual, or members of a minority group, should be given particular attention for their achievement scores and grades are not always indicative of their ability or giftedness.

Nominations will also be accepted from parents.

Step II

Renzulli-Hartman's scale for rating the behavioral characteristics of superior students will be completed by classroom teachers for each nominated student. Scores will be considered in the areas of learning, motivation and creativity.

Step III

Existing test information and all pertinent data of students nominated will be collected and reviewed.

Step IV

The Test of Cognitive Ability will be administered to each nominated student.

Step V

Participating in the screening process will be principals, school support personnel, Project SAGE teachers and the director of Project SAGE. The data listed above will be reviewed carefully and the children most qualified for the program will be selected for further testing.

Step VI

A writing sample will be obtained from each student, Grades 1-4. Interviews will be conducted with K students.

Step VII

Any student requiring additional data will participate in a creative thinking assessment.

Step VIII

The final step in screening will be the selection of children, using all relevant data.

Step IX

Parental approval will be obtained.

Appendix B

Writing Sample and Interview Forms

The Writing Sample 177

Scoring Criteria 180

Scoring Sheet 181

Writing Sample 183

The Interview 185

The Writing Sample
A Tool for the Screening of Academically Talented Students

Rationale

Writing is the representation of thought. It is a mode of communication that is unhindered by translation into spoken word and the interruption inherent in conversation. It is unencumbered by tone of voice or facial expression. Similarly, it provides no immediate feedback for its producer, making it unsusceptible to revision midstream. For these reasons, several researchers maintain the analysis of writing as a valid criterion for assessing intellectual capabilities.

The structure of writing reflects the intellectual processes that generated it. The organization of the mind is represented graphically. Therefore, an analysis of this organization can reveal the thinking patterns of the mind that proceeded it. Literally, writing provides a "peephole" into the mind.

In assessing intellectual superiority many criteria reveal only achievement and provide no insight into the capabilities of the student. Writing evaluation can provide some of the many dimensions. It is for this reason that writing samples will be analyzed in the screening process for inclusion in Project SAGE, Framingham's program for the academically advanced student.

Criteria

Following are the criteria and their definitions that will be used to accomplish the screening.

All examples contained in the following pages are taken from:

Measuring Changes in Intellectual Process,
Lee Odell, Evaluation of Writing. NCTE

Originality of thought

Imagination -

incorporates familiar elements to make an unfamiliar element - such as describes plates as discs.

creates unusual situations - such as outer space or horror scenes.

Feelings - shows feelings of himself or of other people through description, retelling of a situation, or reactions of others.

Unique approach - exhibits an unusual view of the subject matter - such as describing a vacation as a family happening.

Focus - shows a specific view of the subject matter that changes from beginning to end of composition - such as retelling of a personal anecdote as a means of generalizing.

Physical Description -

uses lengthy descriptions of people, setting, etc.

uses many adjectives/adverbs throughout the composition.

Analogy - uses contrasting/similar ideas to create analogies to emphasize a main point - such as comparing the relationship between the supreme court and the law to that of the federal banking system and the provision of the Constitution permitting the federal government to coin money; or comparing the upcoming Summer Olympics in Moscow to those held in 1936 in Berlin.

Literary Devices - uses metaphors/similes to describe and/or compare ideas/events - such as describing a house in terms of personality; showing contrast between summer and winter in reference to aging.

metaphor - the road was a ribbon of moonlight

simile - my love is like red, red roses

Contrast - uses contrasting/similar situations, people, to show relationships between ideas - describing how something should have been, the way things were, how things are the same.

Linguistic cues to use of contrast:

Connectors

or
lest
but
instead
though
despite
nor
otherwise
however
on the contrary
although
else
alternatively
on the other hand
nevertheless
in spite

Comparative and Superlative Forms

more/most
less/least
-er/-est

Negative

no
nothing
not
none
without

Negative Affixes

anti-	im	in-
ir-	il-	dis-
-less	un-	non-

Lexicon

Noun, verb, adjective, and adverb forms of such words as contrast, paradox, distinction, difference, and their synonyms.

Classification - uses categories/examples to show patterns

Linguistic cues to use of classification:

Syntax
Sentences in which a linking verb (to be) joins a subject with a predicate nominative (predicate noun (e.g. Mrs. Johnson is my teacher.) (My assumption here is that one of the noun phrases, either the subject or the predicate nominative, labels the other.)

For example:
because
therefore
since
consequently
if... then...

Mechanics

Sentence Structure -

ability to express ideas coherently.

consistent use of subject/verb/object patterns.

use of other grammatical structures such as prepositional phrases, dependent clauses.

Clarity -

expresses the intended idea

use of punctuation to indicate separation of ideas

Organization - uses paragraphs to separate ideas

Scoring Criteria

N/A - not applicable - student sample did not include that particular criteria

4 - incorporates criteria appropriately to effectively convey ideas, demonstrates careful selection of significant/unusual detail to appropriately support criteria, indicates an unusual degree of either sophistication or creativity

3 - incorporates appropriately criteria to convey idea, demonstrates selection of detail to support criteria, indicates a better than average degree of effectiveness in using the criteria

2 - incorporates criteria to convey idea, selection of detail indicates an attempt to support criteria, indicates that that idea is present but facility is not

1 - inappropriate or sketchy incorporation of criteria selection of detail inappropriate to support criteria

Guideline for Scoring

Limits for N/A - N/A responses in excess of the following limits automatically disqualifies a student from consideration for gifted programs.

I. 4

II. 1

III. 1

IV. 1

Weighted items - Because the writing sample has been included in the screening process to provide a subjective/creative measure for screening students for inclusion into gifted program, the emphasis of the scoring of the writing sample will be weighted to reflect the most subjective criteria, originality of thought. Ratings in this category will be multiplied by 1.5.

Scoring Sheet

	N/A	1	2	3	4
I. Originality of Thought					
A. Imagination					
B. Feelings					
C. Unique Approach					
D. Focus					
E. Physical Description					
F. Analogy					
G. Literary Devices					
Sub Total _____ x 1.5 Total _____					
II. Flexibility of Thought					
A. Contrast					
B. Classification					
Total _____					
III. Fluency of Thought					
A. Change					
B. Sequence					
C. Transition					
Total _____					
IV. Mechanics					
A. Sentence Structure					
1. expression					
2. patterns					
3. grammatical structures					
B. Clarity					
1. expression					
2. punctuation					
C. Organization					
Total _____					

Scoring

	# of Ratings	Score
I. Originality of Thought		
II. Flexibility of Thought		
III. Fluency of Thought		
IV. Mechanics		
Total	Total _____ x	Score __________

Writing Sample

All students in grades 2-5 nominated for the SAGE Program will be administered a Writing Sample. Students will write on the following topic:

"If you could be someone else for the day, who would you be? Explain why."

Guidelines to Follow

Explain to students that we would like a sample of their writing. Read the story starter above, and ask students to complete the thought above. Remind students to elaborate on their answers. Their writing sample may be an essay or a story - whatever the student wishes to write. The length of their writing sample should be as follows:

Grade 2 - no less than one side of the white-lined paper or two sides of green-lined paper.

Grade 3 - no less than one side of the white-lined paper.

Grade 4 - no less than two sides of the white-lined paper.

Grade 5 - same.

The Interview

The interview is conducted in a group setting, including no more than five students. Questions are asked and student responses are documented. Thoughts are rated on a four-point basis (four being the highest, one the lowest) by a team of five teachers, also trained in the writing sample scoring. Weight is given to fluency and flexibility of thought and the ability to elaborate on an idea.

1. **Fluency** - The ability to produce many ideas/responses.

   Example: You have just read the book *Macaroon*. **List** as many reasons as you can think of to describe why Macaroon had a change of heart towards the little girl.

2. **Flexibility** - The ability to produce many different categories of responses.

   Example: A coat hanger may be used for many things, such as garments or a mobile. **How many other uses can you think of**?

3. **Originality** - The ability to produce unique, unusual responses.

   Example: Here you have a variety of objects. Think of something **original** for which you could use them.
   a. First think of many ideas.
   b. Try the idea nobody else would think of.
   c. Choose the one you think is most unusual and try it.

4. **Elaboration** - The ability to embellish upon an idea.

   Example: You have been studying a lot about medieval society. Pretend you are a serf during that time. Write a diary describing a week in your life. Be specific, relating your feelings and duties. Describe as many details in your life as you can.

SAGE Interview

Grades K and 1

1. If you could change one thing in the world, what would you change? Explain your answer.
2. Tell me some of the things you've always wondered about.
3. What are the things you know most about?
4. If you had the opportunity to find out/learn about anything, what would it be?
5. If you could spend the day being someone else, who would you be?
6. **Unusual Uses** (cardboard boxes)

Most people throw their empty cardboard boxes away, but they have thousands of interesting and unusual uses. Think of as many of these interesting and unusual uses as you can think of. Do not limit yourself to any one size box. You may use as many boxes as you like. (We will go around the group, taking one idea from you at a time.)

7. **Product Improvement**

Look at the drawing of the toy elephant. It is about six inches tall and weighs about a half pound. This stuffed toy elephant is the kind you can buy in most dime stores for about one to two dollars. Think of the cleverest, most interesting and unusual ways you can think of for changing this toy elephant so that children will have more fun playing with it.

8. **Ask**

Ask all of the questions you would need to ask to know for sure what is happening. Do not ask questions which can be answered just by looking at the drawing. Think of all the questions you can think of about this picture.

9. Just suppose clouds had strings attached to them which hang down to earth. What would happen?

After all information is gathered, results are entered on the following matrix. The matrix provides a visual representation of results which also provides a weighting from 1-5. Weightings are totaled and indicate the strongest candidates. Final determination is made for entrance into the program by the screening team.

Letters of notification also follow providing a full packet listing testing results and explaining measures employed.

Appendix C

Identification Reporting Forms

Project SAGE

Student ______________________ Grade ______ Date ______________

School ____________________________ Teacher ____________________

	5 99-97%	4 96-94%	3 93-91%	2 90-88%	1 Below 88
Achievement Composite Test Score	( )	( )	( )	( )	( )
Achievement Test Reading Score	( )	( )	( )	( )	( )
Achievement Test Math Score	( )	( )	( )	( )	( )
Achievement TestLanguage Arts	( )	( )	( )	( )	( )
	32-28	27-23	22-18	17-13	Below 13
Renzulli-Hartman Learning Scale Score	( )	( )	( )	( )	( )
	36-31	30-26	25-21	20-16	Below 16
Motivational Scale Score	( )	( )	( )	( )	( )
	40-34	33-28	27-22	21-16	Below 16
Creativity Scale Score	( )	( )	( )	( )	( )
	80-71	70-61	60-51	50-41	Below 41
Test of Cognitive Skills	( )	( )	( )	( )	( )
Writing Sample	4.0-3.5 ( )	3.4-3.1 ( )	3.0-2.8 ( )	2.7-2.0 ( )	1.9-1.0 ( )
	(5) Strongly Recommend		(3) Recommend		(1) Recommend withReservation
Teacher Recommendation:	( )		( )		( )
	Yes		No		
Parent Recommendation	( )		( )		

Project SAGE

Dear ______________________,

Your child has progressed through the Project SAGE identification/selection process. The following results were gathered:

Renzulli/Hartman

Behavioral Rating Scale

Learning ________/32
Motivation ________/36
Creativity ________/40

Test of Cognitive Skills

Analogies ________
Sequence ________
Memory ________
Verbal Reasoning ________
Total Score ________

Achievement Testing

Reading ________
Math ________
Language ________
Composite ________
Writing Sample ________

The results shared above can best be understood utilizing the matrix which appears on the following page. Since it is impossible to meet with all parents individually, screening results are being shared in this manner to enable you to review these results at the earliest opportunity. Further inquiries concerning selection decisions should not be made to your child's school, but directly to the SAGE office. Please be aware that this time of year is extremely hectic and, therefore, potential inquiries will receive a response as soon as possible.

Sincerely,

SAGE Program

Dear Parents:

During the last few months, we have been making assessments of your child's abilities and school progress within the criteria established for Project SAGE, the district's program for the academically/intellectually gifted and talented. We are pleased to inform you that your child, ______________________________, has been selected as a candidate for Project SAGE at the ____________________________________ School.

Since Project SAGE is non-compulsory, it is necessary for us to obtain your written permission in order for your child to become a participant. If you desire to have our child participate in the program, please complete the consent form below and return it in the enclosed envelope by ______________________________.

Results gathered in the identification/selection process are shared on the following pages. Also enclosed is a brief description of the program tentatively planned for next year.

I, ______________________________, give my consent for my child, ______________________________, to participate in Project SAGE at __________________________________ School.

I DO NOT give my permission to have my child participate in Project SAGE at ________________________ School. (Please list your reasons on a separate sheet of paper).

SIGNED: ______________________________
DATE: ______________________________

SAGE Program

Dear Parents,

During the past few months, we have been making assessments of your child's academic/intellectual potential in terms of possible inclusion into the SAGE Program.

Your child, ______________________________, has progressed through our identification/selection process as a result of his/her nomination by either parent/teacher nominations and/or performance on the SRA Achievement Test.

The candidates nominated for the SAGE Program showed varying levels of potential and achievement in the many areas of assessment. In order to qualify for the program, a student must have met the established criteria within **all** the assessed areas. These areas of assessment include:

SRA Achievement testing: Performance in Reading, Math, Language Arts.

The Renzulli-Hartman Behavioral Rating Scale: a rating system which documents the degree/frequency in which certain characteristics/behaviors of the academically/intellectually gifted and talented occur in the areas of learning, motivation and creative thinking.

The Test of Cognitive Skills - a measure designed to assess the level of aptitude attained by students. Emphasis is placed on abilities of a relatively abstract nature that are important to success in the placement of a student in the SAGE Program.

The Writing Sample, Grades 2-5.

The Interview, Grades K-1 - an instrument to assess the thinking processes and flow of thought of a candidate.

Parent/Teacher Recommendations - Data is collected from all sources. Parent and teacher recommendations are given **equal** consideration.

Your child, ______________________________, did not meet the criteria in all areas of assessment. Although your child has not evidenced a demonstrated need at this time, this does not mean that your child does not possess excellent abilities. There will be opportunities for your child to become involved in a variety of activities designed by the SAGE Program since a portion of the SAGE program is the integration of the SAGE thinking skills curriculum into the regular classroom.

The results shared on the following pages can best be understood utilizing the matrix which follows. All data gathered is rated from 1 to 5: 1 being the lowest rating, 5 the highest. Students who demonstrate the greatest **need** for the program will fall in the upper end of this weighting system in **all** areas. Since it is impossible to meet with all parents individually, screening results are being shared in this manner to enable you to review these results at the earliest opportunity. Further inquiries concerning selection decisions should not be made to your child's school, but directly to the SAGE office. Please be aware that this time of year is extremely hectic, and therefore potential inquiries will receive a response as soon as possible.

Sincerely,

Appendix D

Thinking Skills

Glossary of Terms 197
Bloom's Taxonomy 199

GLOSSARY

Analysis	Asking why. Recognizing rules of logic. The pupil will determine the nature of something, by breaking unique characteristics.
Attributes	Characteristics as in size, shape, texture, color, form, that enable students to categorize, and classify given objects.
Brainstorming	The ability to generate as many ideas as possible on a given topic. Emphasis is placed on quantity of ideas, rather than quality which will not inhibit the flow of ideas. The two basic rules are: no idea that relates to the topic is silly, and no judgments should be made. Children are encouraged to "hitch- hike", get ideas from other ideas.
Convergent Thinking	Coming up with one expected answer. Thinking along one line--one track.
Creative Problem-Solving	Fact-finding, problem-solving, idea-finding, solution-finding, acceptance-finding. A process in which decisions are made and implemented in a logical manner.
Critical Thinking	The ability to look at situations with an open mind and provide evidence, thus supporting decisions made.
Deductive Reasoning	Based upon given information (clues), students are able to draw logical conclusions in order to reach a final solution.
Divergent Thinking	Coming up with many, or a wide variety of answers. The answers are not expected nor is there one right answer.
Elaboration	The ability to embellish upon an idea, produce detailed steps, to embroider, stretch or expand upon things or ideas. Example: Given a simple outline of a road, children are asked to add as many details as they can to create a unique scene. To further develop this, they may be asked to write a story or a poem.
Evaluation	The pupil is asked to make judgments upon a good or preferred solution to problems. The judgments should be made according to evidence or standards.
Figural Analogies	Seeing how two objects relate to one another in order to create another pair of the (having the) same association.
Figural Patterns	Children are required to observe carefully in order to determine characteristics of a given object. Students are then able to categorize the objects and create more on their own.
Flexibility	The ability to produce many categories of responses, also the ability to shift categories. Example: A coat hanger may be used for many things, such as garments or it may be used for construct a mobile. How many other uses can you think of?
Fluency	The ability to produce many ideas/responses in a given time.

Inductive Reasoning	Allows students to generate conclusions not solely based on given information, but on their ability to reach a conclusion which is somewhat supported, but not necessitated by the premises he/she uses.
Inferences	Based on given information, students can generate good arguments and discussions as to what are the reasonable and unreasonable conclusions.
Relevant Information	Information that relates to the topic.
Sequences	The perception of the relationships from one figure or word to the next in order to discern what follows in the pattern.
Synthesis	The pupil is asked to be creative in thought and produce something original, different and unique.
Syllogisms	Syllogisms are problems that help strengthen analytic thinking. A syllogism is made up of three sentences or statements. The three sentences or statements are referred to as an argument. The first two statements are called premises. The third sentence is called the conclusion. A syllogism always contains clues that support or prove the conclusions. Syllogisms are worded in a special way. Premises begin with "a", "all", "no", or "some"; they use the verbs "is", "are" or "are not". A conclusion begins with the word "therefore". It is not important whether or not the premises are true or whether they make sense. Your only concern is that the two premises do prove the conclusion. If a conclusion follows logically from the two premises, an argument is said to be valid. If a conclusion does not follow logically from the two premises or is not supported by the two premises, an argument is said to be invalid. Example: *All bears have fur.* *All Kodiaks are bears.* *Therefore, all Kodiaks have fur.*
Verbal Analogies	Seeing how two words relate to one another in order to create another pair of words having the same association.
Verbal Classification	The organization/classification of words based on letter patterns, common definitions, or the configuration of words themselves.

Bloom's Taxonomy

1. ***Knowledge:*** Knowledge refers to the ability to recognize or recall information. Teaching this phase of the taxonomy merely involves "pouring in" information.

This phase of instruction is usually accomplished in a formal setting. It can be accomplished with very large groups.

> A. Activities usually done by student: (1) responds to classroom situation--is attentive; (2) absorbs information--looks, listens, reads; (3) remembers; (4) practices effective procedures--drills, recites; (5) covers information in books; (6) recognizes information that has been covered.
>
> B. Evidence of student's success: (1) completes class and homework assignments; (2) completes programmed learning sequences; (3) scores satisfactorily on objective tests.
>
> C. Activities usually done by teachers: (1) directs student activities; (2) gives information--lectures, drills; (3) shows information--audio-visuals, demonstrations; (4) enlarges information; (5) makes and administers objective tests; (6) makes homework assignments.
>
> D. Sample questions: (1) What is the formula for finding the circumference of a circle? (2) What are the three types of burns and standard treatment for each? (3) What nations cooperate in the European Common Market? (4) What is the Haber process for making nitrogen?

2. ***Comprehension:*** Comprehension represents the lowest level of understanding. The student should be able to make some use of the knowledge that he has gained, but he may not necessarily be able to relate it to other material or see its fullest implications.

This instruction is usually accomplished in a formal setting with a group no larger than a typical class.

> A. Activities usually done by student: (1) explains information rather than merely quotes it; (2) makes simple demonstrations; (3) translates information into his own words; (4) extends information to new situations; (5) interprets information from technical terms to familiar terms.
>
> B. Evidence of student's success: (1) has the ability to intelligently discuss information; (2) can write simple essays; (3) scores satisfactorily on objective tests.
>
> C. Activities usually done by teachers: (1) demonstrates material; (2) listens to students; (3) asks questions; (4) compares and contrasts students' answers;

(5) examines students' ideas; (6) makes and administers objective tests and low-level essay tests; (7) makes carefully selected homework assignments.

D. Sample questions: (1) Explain the meaning of flag signals. (2) Change a written math problem into a formula. (3) What is the meaning of "your rights stop where my nose begins"?

3. ***Application:*** Application refers to the ability to use abstractions in particular and concrete situations. An example of this phase could be the using of an abstract mathematical formula to solve a specific math problem. In this phase instruction is usually rather informal. It is readily adaptable to laboratories, shops, the field, the stage, or to small groups within the classroom.

A. Activities usually done by the student: (1) solves novel problems; (2) constructs projects, models, apparatus, etc.; (3) demonstrates use of knowledge.

B. Evidence of student's success: (1) masters problem- solving tests; (2) constructs equipment, models, graphs, etc.; (3) demonstrates ability to use equipment.

C. Activities usually done by teacher: (1) shows students ways to facilitate their work; (2) observes students' activities; (3) criticizes students' activities; (4) helps design students' projects; (5) organizes field trips and contests.

D. Sample questions: (1) What could a fully clothed person do to remain afloat in water for several hours? (2) What general principles of learning can be used in improving reading?

4. ***Analysis:*** Analysis refers to the breaking down of a communication into its basic parts. This allows the relationship between ideas to be seen more clearly and allows basic arrangements to be studied. This phase of instruction is best conducted in an informal and irregular manner. Small group and independent study techniques are especially useful here. Homework assignments directed toward analysis have been especially valuable.

A. Activities usually done by student: (1) discusses information in depth; (2) uncovers interrelationships among ideas; (3) discovers deeper meanings and insinuations that were not apparent at first; (4) sees similarities and differences between styles.

B. Evidence of student's success: (1) makes effective outlines; (2) writes effective precis; (3) completes effective experimental write-ups.

C. Activities usually done by teacher: (1) probes, guides and observes students; (2) acts as a resource person; (3) plans for and conducts discussions, seminars, and group critiques.

D. Sample questions: (1) What are the elements of the nitrogen cycle, food chain, taxation, and inflation? (2) Look at the "Mona Lisa" and tell which elements and principles of art were used by the artist.

5. ***Synthesis:*** Synthesis is the putting together of elements or parts so as to form a whole. It is the arranging and combining of pieces to form a pattern or structure that was not clearly evident before. This phase of the Taxonomy is especially adaptable to independent study. It can be accomplished in almost any setting including the home. The library is especially useful. Much reflection is generally required--these results often come slowly. Patience is necessary.

A. Activities usually done by student: (1) produces unique communications; (2) formulates new hypotheses based on analyzed information; (3) makes discoveries and generalizations; (4) shows relationships between ideas and philosophies; (5) proposes new ways of doing things.

B. Evidence of student's success: (1) activities (as above) effectively completed; (2) writes quality essays and term papers; (3) makes blueprints or sets of plans for projects.

C. Activities usually done by teacher: (1) extends students' knowledge; (2) analyzes and evaluates students' work; (3) prepares reading lists--including critical questions; (4) brings in consultants; (5) plans seminars; (6) allows for independent study.

D. Sample questions: (1) Combine poetry, modern dance, music, and colored light into a presentation which emphasizes basic principles of American democracy. (2) Create a 3-D object which highlights Einstein's fourth dimension.

6. ***Evaluation:*** Evaluation involves making judgments about the value of materials, methods, or ideas for a given purpose. This represents the highest level of intellectual functioning. This process is difficult for even the brightest students. Results should not be expected to come quickly. Students should not feel rushed. This phase must be taught in a very informal manner and is handled best in small groups.

A. Activities usually done by student: (1) makes firm commitments; (2) judges quality based on sound criteria; (3) effectively supports or disputes ideas, theories, etc.

B. Evidence of student's success: (1) oral and written critiques are logical; (2) speeches and essays are based on sound information; (3) projects are completed successfully; (4) performance is effective (athletic, artistic, musical).

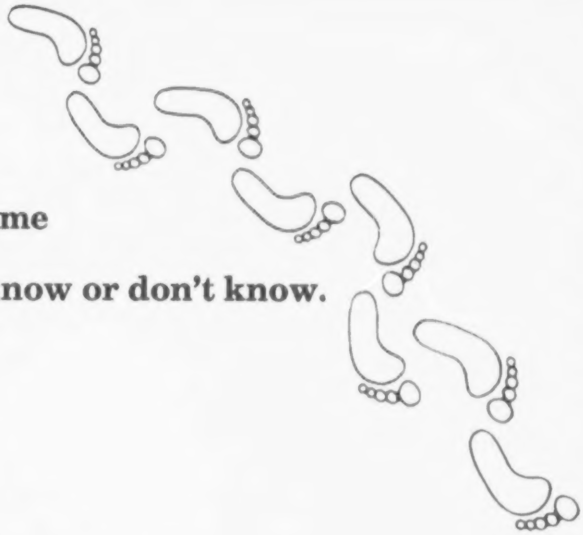
C. Activities usually done by teacher: (1) accepts students' ideas; (2) plans competitive essay assignments; (3) plans tournaments (speech, debates, etc.); (4) helps establish criteria for evaluations.

D. Sample questions: (1) Decide whether or not the film HAWAII is an accurate portrayal of Hawaiian life at the time of the early missionaries. (2) Decide whether or not the United States should supply fish protein to persons in underdeveloped countries. What might be some repercussions from this act? (3) List some of our current national problems in order of importance.

While gifted curriculum usually emphasizes the upper three levels of Bloom's Taxonomy (Analysis, Synthesis, Evaluation), the entire cognitive domain of the taxonomy should be considered in the context of gifted curriculum. Often, assumptions are made that gifted students are able to analyze, synthesize and evaluate when they lack experiences in acquiring, comprehending and applying knowledge as Bloom's Taxonomy is arranged in a hierarchical order based on the generalization of knowledge or knowledge transfer.

Appendix E

Forms to Assist with Differentiating the Curriculum into the Content



Steps of a Theme

1. **Find out what children already know or don't know.**

2. **Introduce the theme**

a book
a film
a trip (use maps)
a speaker
a discussion

3. **Plan your groups**

Activities which address visual, auditory and kinesthetic learning.

4. **Collect information**

trips
reading
drawing
interviews
photographs

5. **Use information**

writing
cooking
drama
drawing
building
painting

6. **Observe what further activities are needed.**

7. **Sharing-not just handed into the teacher; actual sharing**

display
dramatization
collection
t.v. show

8. **Evaluation of positive and negative aspects**

Organizing a Theme

Brainstorm
Organize and Categorize
Develop Concepts
Plan Activities
Develop Skills List
Gather Resources

Concepts

THEME ____

What do you want the children to understand?

1)

2)

3)

4)

5)

6)

Thinking Skills

Content
(Learning Objective for
each lesson)

1.

2.

3.

4.

5.

6.

7.

8.

Based on an 8 lesson mini study.

Teacher Planning Sheet

major concepts	vocabulary
games, projects & art activities	field trips & speakers
books	audio-visual materials

INVENTIONS - A Sequence Developed by Sage Adopters (Springfield, MA)

DEVELOPMENTAL LEVELS

CONTENT	PROCESSES			PRODUCTS	AFFECTIVE	VERBS
Key Questions	Thinking	Research	Basics			
1. What are the characteristics of inventions?	Knowledge Classification Analysis Fluency Flexibility Originality Elaboration	Card Catalogue Note-Taking Primary & Secondary Sources Bibliography	Listening Speaking Reading Writing	Web of Inventions Outline Models	Contribute Share Respect each others ideas Creativity	Locate Select Categorize Compare/Contrast
2. Give the statement: Man is creative. Why are there inventions?	Analysis Synthesis Evaluation Fluency Flexibility Originality Elaboration	See Above #1 Skimming Index	Listening Speaking Reading Writing	Develop own invention Discussion Informal Debate	Self esteem Creativity	Design Construct Illustrate Adopt Adapt
3. If one investigates inventions through history what patterns emerge?	Knowledge Analysis Synthesis Evaluation Fluency Flexibility Originality Elaboration (SCAMPER)	See Above #1 Outline Skimming Index	Listening Speaking Reading Writing	Time line Book Webs	Develop a sense & feel for past and begin to develop connection to the future creativity	Uncover Dissect Examine Simplify Categorize Inspect Combine Develop Blend Compose
4. What effects or influences do inventions bring about in society?	Bloom's Taxonomy Productive Thinking Model SCAMPER	Interview See #1 above Questioning	Listening Speaking Reading Writing	Develop Questionnaire Discussion	Respect for lifestyles of other people (especialy elderly) Enlightenment of past experiences	Develop Organize Evaluate Rank Recommend

INVENTIONS - A Sequence Developed by Sage Adopters (Springfield, MA)

DEVELOPMENTAL LEVELS

CONTENT	PROCESSES			PRODUCTS	AFFECTIVE	VERBS
Key Questions	Thinking	Research	Basics			
5. Why is freedom to invent a positive force in society?	Bloom's Taxonomy (all levels) Productive Thinking Model SCAMPER	See #1 Above Skimming	Read A Wrinkle in Time	Discussion Debate	Appreciation of a free society Enlightenment & understanding of other cultures/norms Creativity	Determine Editorialize Predict Compare/Contrast Examine Critique
6. What effect do ideas and inventions from the past have on present & future inventions?	Bloom's taxonomy Cause/Effect Productive Thinking Model SCAMPER	See Above #1 Multiple sources	Read A Wrinkle in Time	Web Chart Discussion Debate Book Cartoons	Sense of the past and its relation to the future Creativity	Predict Analyze Translate Select/Reject Blend Produce
7. What types of inventions will be needed in the future given the challanges of today?	Bloom's Taxonomy Productive Thinking Model Creative Problems Solving	See Above #1 Needs Assessment	Read A Wrinkle in Time	Drawings Model Debate Needs Assessment Form	Awaken to the challenge of today Understand future needs Creativity	Predict Evaluate Recommend Design Produce Organize Critique

Appendix F

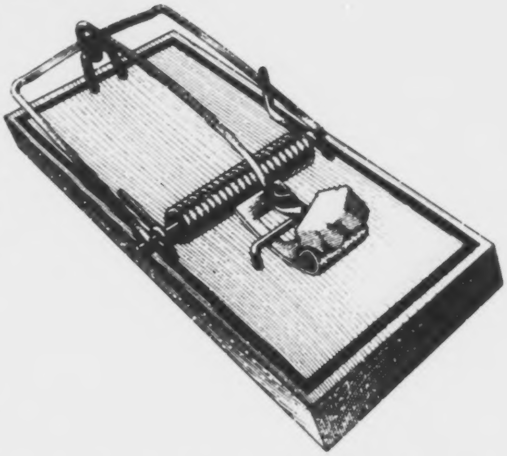
SAGE Mini-Sampler

SAGE SAMPLER

PROJECT SAGE

Sample lessons from SAGE Mini-Units which illustrate how higher level thinking skills are infused into content.

INVENTIONS



Overview of Unit: From the cause-and-effect machines of Rube Goldberg, to alternate uses of common objects, to research of inventors and inventions, students will develop creative thinking skills, conceptualize the effects of inventions on the past, present, and future, and utilize their inventive skills in order to create their own inventions.

Cognitive Levels: Analysis, Synthesis

Skill: Deductive Reasoning, Logic Elimination

Objective: Students will find the solution to the problem, utilizing the clues provided. Through the process of elimination, using a matrix or grid, students will be led to the final conclusion.

Introduction: As detectives, you are faced with a problem to solve.

Family Inventions

While working on her family tree, Suzanne discovered some members of her family were famous for their well-known inventions. Suzanne's cousin, aunt, uncle, mother, father, grandmother, and grandfather invented the saw, milk container, electric lamp, toothbrush, hand cream, hairbrush, and eye glasses. Suzanne was provided only the following clues, not who invented what. It is your mission to match Suzanne's relatives with their well-known inventions.

Activity 1. Develop a matrix or grid to aid you in solving this problem.

Activity 2. Add the names of the relatives across the top of the matrix and their inventions down the side of the matrix.

Activity 3. Use the following clues to crack the case and help you to eliminate possibilities that do not exist.

> Clues:
> The inventor of the saw is married to the man who invented eyeglasses.
> Ruth invented the milk carton in Wisconsin.
> Ruth's brother invented the hairbrush in Oakland.
> The inventor of the toothbrush is the niece of the inventor of the hairbrush.
> The lady who invented the electric lamp is the daughter of the inventor of the saw and the wife of the inventor of the hairbrush.
> Father is not an inventor of hand cream and he did not invent eyeglasses.

Futuristics

Overview of Unit: Knowledge and understanding of current trends and future forecast will help students consider appropriate options for the future understanding of change, planning, analysis, evaluation, creative thinking, defining relationships and effects, flexible thinking, and forecasting. These processes help the future become more real for students. Indeed, that is where they will be spending the rest of their lives.

Cognitive Levels: Analysis, Synthesis Evaluation

Skill: Cause and Effect Relationships, Forecasting, Planning

Objective: Students will identify and evaluate increasing and decreasing trends and describe how these trends will affect a specific population. Based upon a specific trend, students will design a museum exhibit for the year 2030.

Introduction: It is the year 2030. We gather for a class reunion at the newly created Science Center. After our entrance, we view a most beautiful sight - a resource that we took advantage of so long ago. (Show overhead of picture of tree.)

Looking Toward The Future

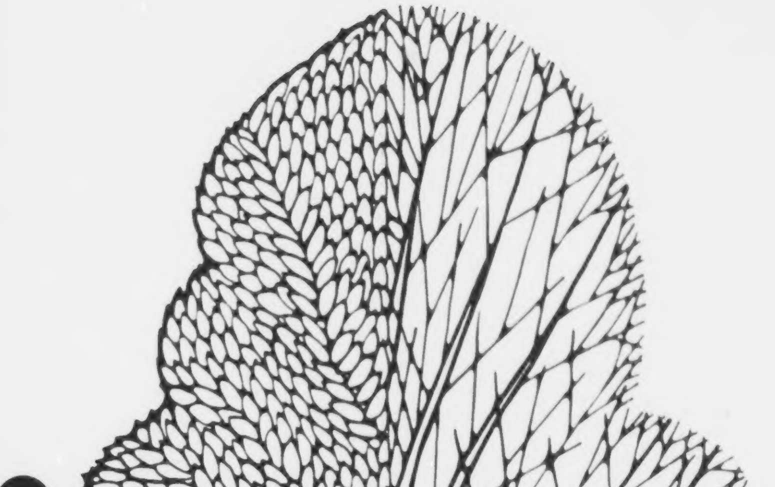
Activity 1: Students will brainstorm the occurrences from the current date to the year 2000 in order to determine why the tree became extinct.

Activity 2: Students will consider other trends of increasing and decreasing value. Brainstorm in small groups and list these trends, i.e. increases in use of energy, availability of solar and nuclear energy, decreases in supply of coal, natural gas, and wood.

Activity 3: Students will determine who will be most affected by these trends: elderly, yuppies, teenagers, etc.

Activity 4: Students will identify advantages and disadvantages of the trends they have listed. They will then forecast how long they believe this trend will be in existence.

A tree - circa 2000
Now extinct, tree by-products (wood, paper, etc.) were major economic influences in the 20th century.



Structures and Forces

Overview of Unit: The purpose of this unit is to extend students' knowledge and application of geometric principles. The unit presents geometric concepts in a broad-based interdisciplinary manner through the utilization of experimentation, logic, creativity, literature, and art. This unit allows students to apply geometric concept areas to architecture (structures).

Cognitive Level: Analysis

Skill: Analogy; Observation of natural shapes and forms

Objective: Students will make metaphorical comparisons for given structures.

Learning Activity: Simile and Metaphor in Design

Introduction: Brainstorm metaphorical comparisons such as: What color is sleep? Sleep is yellow because ..., drawing upon metaphorical comparison. Which weighs more, a boulder or a broken heart? Which weighs more, a scream or a bag of groceries? Which is deeper, an oil well or loneliness? Which is happier, a blade of grass or a snowflake? Which travels faster, gossip or a racehorse?

After students establish the metaphorical comparisons between each example used, explain to students, "Designs of structures stimulate different feelings in people who view and interact with particular architecture."

Activity 2: Which metaphorical statements match the building types listed?

Bank - Nursery - Prison - Cathedral - City Hall - School of Architecture
an overweight diamond-studded man, stuffing himself with caviar
a playpen filled with colorful toys and children
a private spot in the middle of a canyon (looking up)
a cage with no way in or out
a cloud to rest on
flexible and expandable structure
all man's inventions lined up for viewing
offices with official-looking stamps and papers

Activity 3: Choose an item from the following list and design a building that utilizes the same shape or form of the chosen item. Create an analogy between your building and your chosen item.

gear
starfish
paper tube
leaf
shell
pie plate
umbrella
Legg's container
styrofoam cup

Alternate Energy Sources

Overview of Unit: We are faced with an energy crisis that exists now and will exist for decades ahead. Conservation will have an important impact; however, alternate sources of energy, such as solar, tides, nuclear and geothermal power, must continue to be explored and researched.

The survival of any society is dependent upon future study. Predictions of the future in assessing technology and projecting where it will lead are major components of this problem-solving unit.

Cognitive levels: Analysis, Synthesis, Evaluation

Skill: Creative Problem-Solving: Productive Thinking (Fluency, Flexibility, Originality, Elaboration, Evaluation)

Objective: Students will develop an alternative plan for the proper disposal of nuclear waste.

Learning Activity:

Introduction: You have been selected by the head of the U. S. Safety Commission to serve on a Citizens' Advisory Committee. Your mission is to deal with national concern regarding the improper disposal of nuclear waste. This group has been asked to present a plan for the disposal of nuclear waste.

Steps in the process:

Fact-finding

Each advisory group will list as many important facts about the situation as they can. (Pose the question, "What are some problems our country faces as a result of improper disposal of nuclear waste?*)

Groups will brainstorm problem areas and will select an area to clarify.

Each group will provide an illustration of the problem, list possible causes, dimensions of the problem, and possible effects.

Stating the Problem

The groups will identify and state the major problem using this format: In what ways might we...?

Generating Alternatives

The groups will list ways to deal with the problem. Creative and unique solutions are encouraged. Encourage students to develop flexibility.

Modify
Combine
Minimize
Magnify
Adopt
Substitute
Rearrange
Put to Other Uses
Reverse

Determining a Solution

Students will select their three best ideas and evaluate them on a grid such as the one below. Discuss appropriate criteria for evaluating the ideas. The suggested criteria below may be provided or you may encourage students to develop their own criteria.

Use a scale of 1-5 for evaluating the ideas. A poor rating is 1; a high rating is 5.

	Best Ideas	**Time**	**Cost**	**Resources**	**Total**
1.					
2.					
3.					

Total score for each idea. The best solution to the problem is:

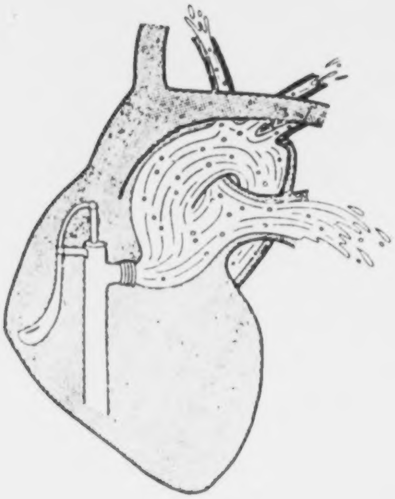
Developing an Action Plan

The group will develop a plan to achieve acceptance of this idea by the U. S. Safety Commission. Use the following questions as guidelines:

Who will do what?
How will it be done?
What time sequence will be followed?
Precautions?
Possible obstacles? Ways to overcome obstacles?
Locations for implementation?
Possible sources of support?

Write the plan in the form of a proposal.

As a follow-up, have each group design and present a skit to "Sell Their Solution" to the class.



KEEP ON PUMPING

Grade Level: Adaptable 1 - 6

Title of Lesson: "Creative Thinking"

Cognitive Level(s): Synthesis

Skill: Brainstorming, fluency

Objective: Students will brainstorm for expressions, songs, etc., using blood and heart in them, selecting one or more of these phrases to illustrate in a creative way.

Introduction: (Motivation) Cardboard pictures representing the phrases "cold-blooded" and "royal blood" will be placed on the board and the phrases will be introduced. In groups of four, students will be encouraged to brainstorm for as many expressions using blood or heart as they can generate within a specified time period.

Description of Learning Activities: At the end of 5-10 minutes the student recorder will count and report the number of responses. Each student in the group will select a response to illustrate. Materials such as paper, oaktag, markers, etc. will be provided. Students share illustrations with the class when completed.

Select a lesson from the Inventions Unit. Using a lesson format sheet, fill in the necessary information. Also list the content process and product on a separate line.

When developing your own lessons and units, this format will provide a structure. It is important to keep in mind the need for differentiating the curriculum for the gifted and talented as noted in the beginning of this section. You will then be able to tailor your curriculum materials to meet the needs of your students.

The higher cognitive level of synthesis is best known as the level where the pupil is expected to engage in creative thinking and produce something unique and original. The emphasis is on productive thinking which focuses on fluency, flexibility, originality, and elaboration of thought.

Unit:
Grade Level:
Title of Lesson:
Cognitive Level(s):
Skill:
Objective:
Introduction: (Motivation)
Description of Learning Activities:

Appendix G

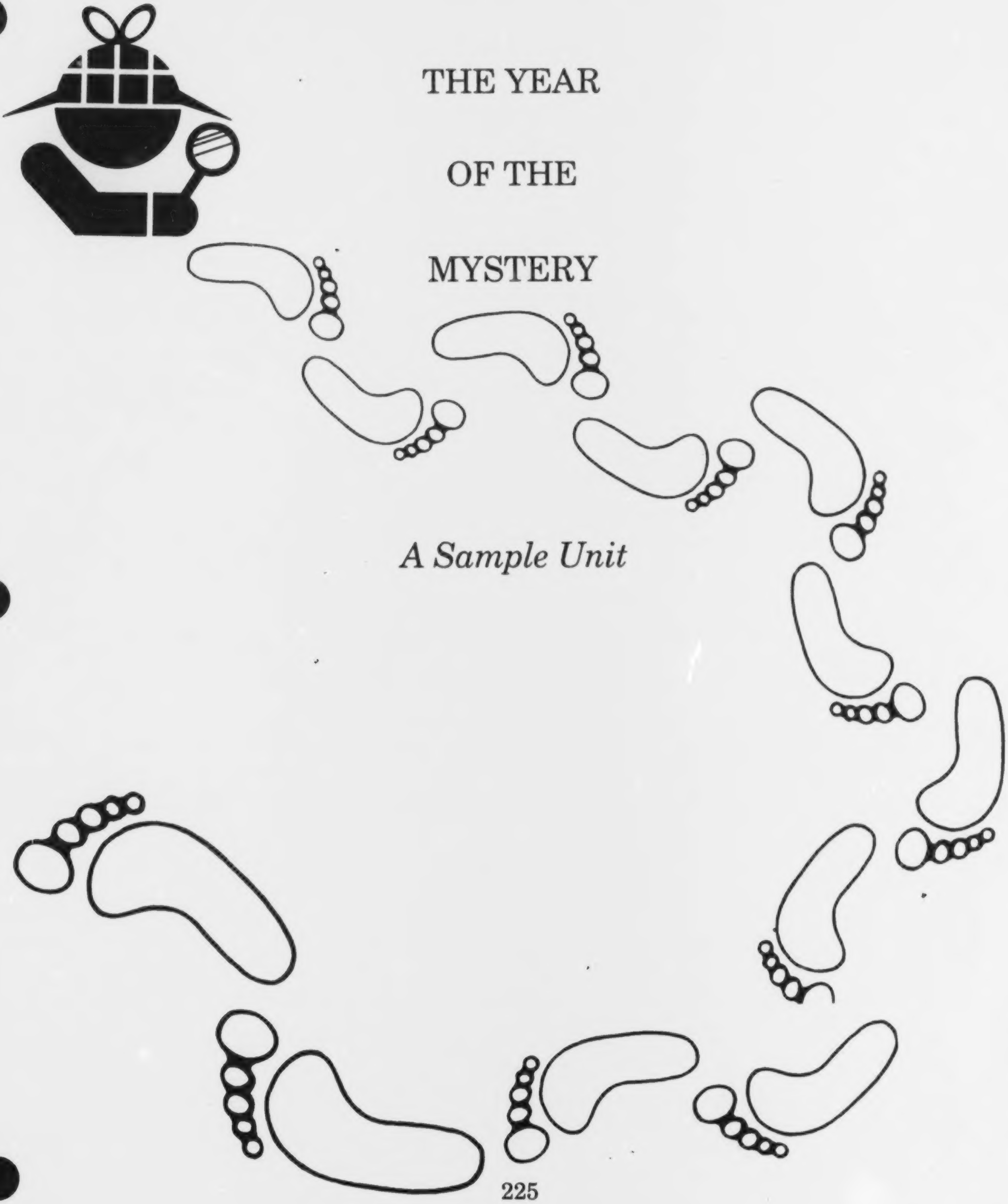
The Year of the Mystery

THE YEAR

OF THE

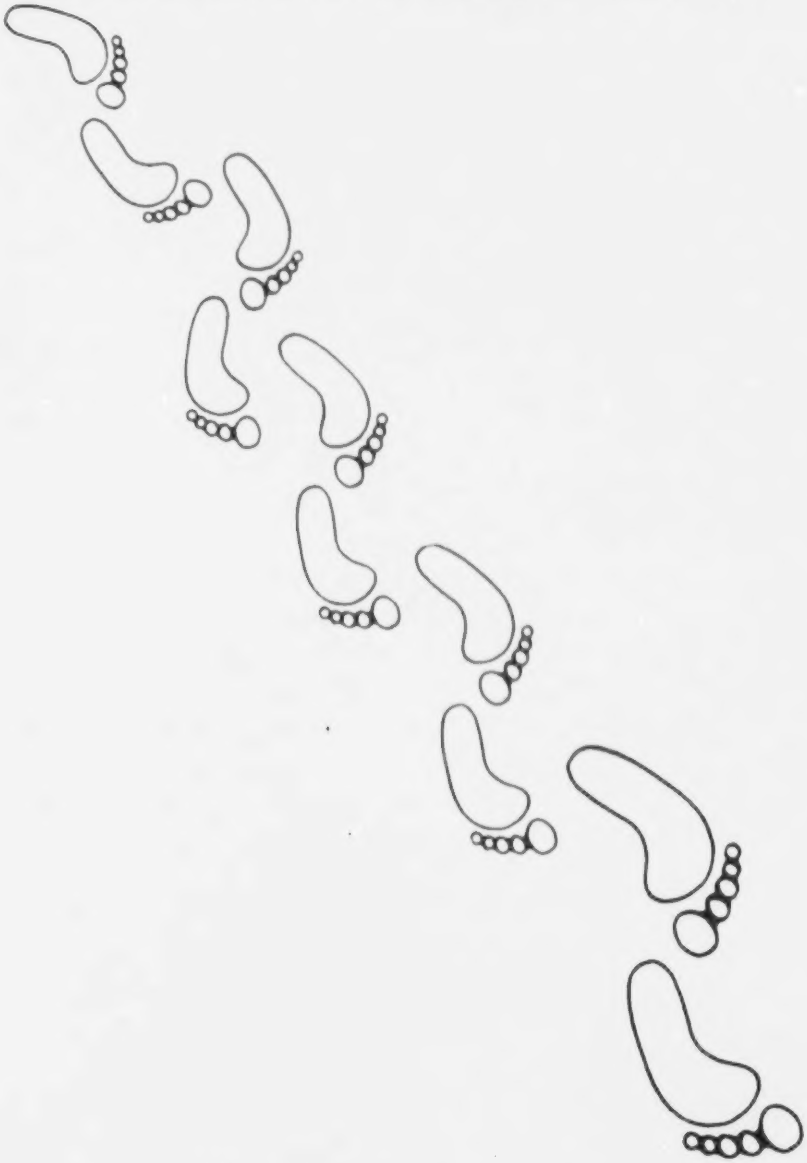
MYSTERY

A Sample Unit



The Year of The Mystery

The Year of the Mystery is the theme developed by the SAGE staff in 1986. The letter to parents stating the objectives and selected activities to illustrate the process of developing a mini study are included. The teacher needs to determine the specific thinking skills to be taught and integrate them into the content objectives. A planning grid has been included based on the four thinking skills described. There is a sample lesson for each of the following areas: critical thinking, logic/reasoning, creative thinking, and creative problem-solving. The "Implementing SAGE" section describes the step-by-step process used in developing a mini-study unit.



Dear __________

We hope that you had a wonderful summer. Welcome to the SAGE Program - The Year of the Mystery. Yes, this will be a mysterious year for students in the SAGE program. As students begin to investigate "What is a mystery?" they will identify an array of thinking skills employed by those individuals who solve mysteries (from detectives to scientists). Exercising the array of thinking skills (including analysis, observation, cause and effect, inference, sequencing, details, fact vs. opinion, etc.), students will learn to apply these skills when solving the mysteries of architecture, famous people, pirates, literature, detectives, mythology, art and music, oceanography and more.

For each of the aforementioned topics, a question will be posed for students to investigate. This will occur from September to January. In the past our topics of study required semester long concentration aimed toward a final product. It is not our aim to study in depth any of the variety of subjects (approximately two weeks in duration) to spark them into a self-initiated independent mystery study.

The final product will then be a result of each student's solution to his/her independent investigation. Independent investigations will occur in February and March. When available, students will be matched with specialists in their selected fields of study to further enhance their expertise. We would appreciate any parental assistance in this area as our parents are our greatest resource. During the months of the independent study, children will have the opportunity to work within the SAGE environment; it is expected that they bring in research materials to class. The last months of the school year, students will share their products with their peers and others.

We have planned an exciting year! We hope classroom teachers and parents will participate in our "MYSTERY MANIA." Please contact your SAGE staff member to see how you can work together with her in the year to come.

Sincerely,

The SAGE Staff

Unit Objectives:

To analyze a series of interrelated facts in order to solve a mystery.

To examine facts and inferences.

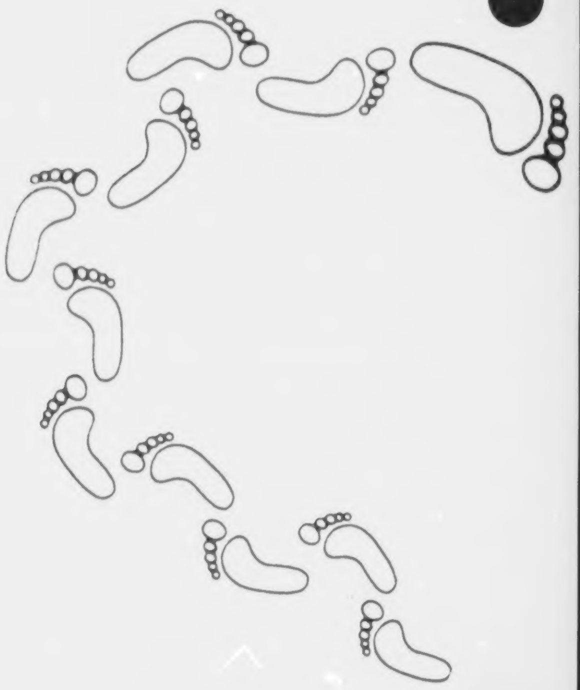
To sequence a related series of events.

To analyze and synthesize elements in a mystery.

To develop inductive and deductive thinking skills, cause and effect relationships, coming to logical conclusions based on evidence gathered.

To develop organizational skills necessary to solve mysteries and further develop patterns which enable the students to follow through on independent research.

Students will demonstrate an understanding of the difference between the literal meaning of a mystery (i.e. Sherlock Holmes, Hitchcock, Poe) as well as the global meaning (i.e. Mysteries of Life: Ocean, Mythology, Pirates, Famous People, etc.).



Dear Parents,

People who have specialties - talents, skills, hobbies or interesting experiences - can do much to enrich the SAGE Program. Volunteers are needed to share their knowledge and abilities with a whole class or to help an individual student to explore a special interest area in depth.

Please indicate below those specialties you would be willing to share with students in SAGE. Indicate in a few words, the specific nature of your specialty (e.g., "Can demonstrate and teach interpretative dance.... can show slides and discuss modern art.... can demonstrate the baking of bread.... can give talk on principles of architecture, building codes, patent law, local history, medical aspects of smoking, gum disease, etc."). Also indicate the grade level(s) for which you think your specialty is best suited. Thank you for your help.

Name____

Child's Name__________________________________

Grade and School_______________________________

Specialties____

____

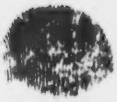
____

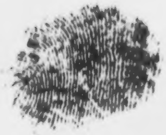
Parents sign below indicating to us your awareness of the 1986- 1987 SAGE Program.

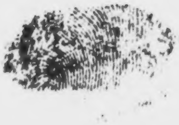
Signature____

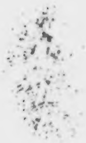
Date____

A Mystery Is . . .









A Mystery Is . . .

Sample responses:

Who, what, where, when, and how

Something you don't know, but
want to find out about

What a detective solves

A thing you need to think about and analyze

Something no one knows about

Something strange

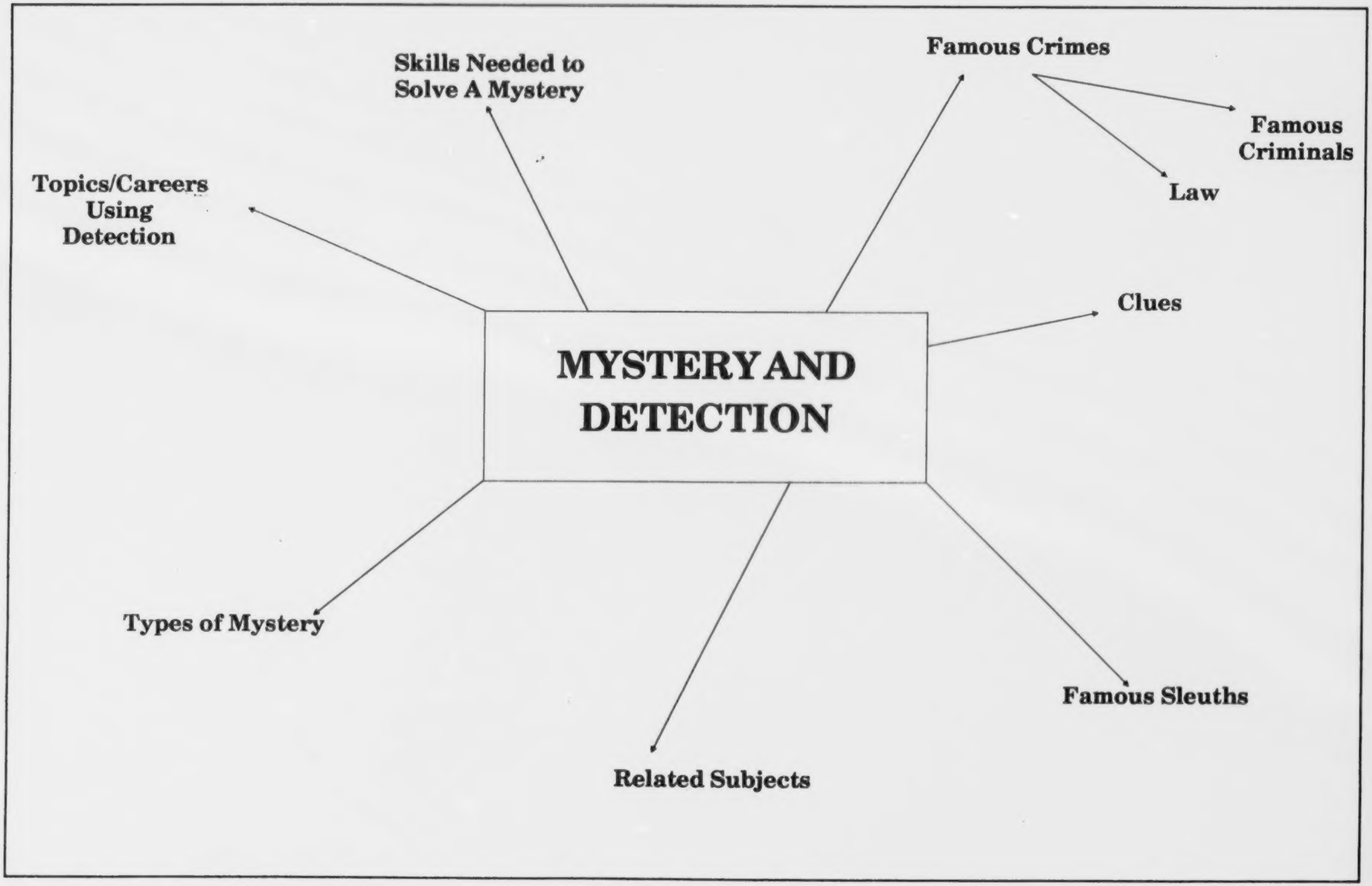
Clues that form an answer

Something you want to figure out

"Who done it?"

WHO SOLVES

MYSTERIES?


Skills Needed to Solve A Mystery
Famous Crimes
Famous Criminals
Law
Topics/Careers Using Detection
MYSTERY AND DETECTION
Clues
Types of Mystery
Famous Sleuths
Related Subjects

Sub-topic: Architecture

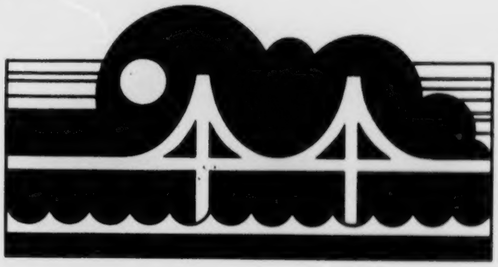
Questions about Bridges

From SAGE Primary Students

1. How are bridges supported?

2. What materials are used to make bridges?

3. What are some famous bridge designs?
    - Roman Arch
    - Clapper Bridges
    - Suspension Bridge
    - Truss Bridges
    - Cantilever Bridges



4. How are bridges built?

5. How does a bridge withstand pressure?

6. How do air pressure and water pressure affect bridge building?

HIGHER ORDER THINKING SKILLS

Lesson

Unit	Critical	Logic/	Creative Thinking	Creative Problem-Solving	Research
	(Analysis Evaluation)	Reasoning (Analysis)	(Synthesis) Productive Thinking Model	(Analysis, Synthesis, Evaluation)	
Keep On Pumpin'	Identify cause/ effects of heart disease.	Logic Problem with 3 doctors	Creative Thinking Lesson-Sayings and songs with blood or heart in them.	In what ways may we create an early warning device to signal heart problems.	See Research, Research p. 10 in unit
The Year of The Mystery	An then . . . (cause/effect)	Safari Clues	Astonish Me!	Suspense!	In Depth Independent study with a mentor

Unit: Mystery

Grade level: 1-6

Title of Lesson: "And then..."

Cognitive Level(s): Analysis, Synthesis

Skill: Cause and Effect, Productive Thinking

Objective: Students create a character and a situation which logically follow a sequence presented in a story starter, focusing on the cause and effect of the character's actions.

Introduction: Tell students a simple story which stops suddenly and say "And then?". Example: The boy was walking to school and found a large envelope on the ground. As he stopped to pick it up, an enormous man stepped on his hand. And then? Ask a student to respond to why the man stepped on his hand? Have the class say, "and then?" After he gives a reason for the man stepping on his hand, ask for another "and then?" After 3 "and then's" tell the students they will use another situation to create a series of cause and effect events for the character, Willis, who will now be introduced in the following scenario.

Description of Learning Activities:

Students are seated in a circle and are told that they will be creating their character in a 10-minute timed period. Set the timer and turn on a tape recorder (or ask a student to record the events). Present the following story or one of your own.

Willis had finally hidden the loot and he was anxious to get out of the forest and go home. He had some ideas about how he wanted to use his day's earnings. It was starting to rain lightly so he began to look for the path home. He started to panic because he couldn't see the familiar path he always took. Suddenly a bolt of lightning hit a tree not a hundred feed away from where Willis stood. Now, truly frightened, Willis realized he was truly lost.

And then...

After 10 minutes, have the students listen to the entire story and discuss the character. Ask - What would you do if you were in this situation? As a follow-up, they could create their own scenario in writing or via cartoons.

Unit: Mystery

Grade level: 1-6

Title of Lesson: Safari Clues

Cognitive level(s): Analysis

Skill: Logic, Deductive Reasoning

Objective: Students will create a clue that will enable them to solve the logic problem.

Introduction: (Motivation) Show students pictures of the animals used in the puzzle. (The animals presented may be used or select your own.) Explain that you are on a jungle safari in Africa and a strange situation occurred when you stopped at an animal sanctuary. There was only enough film for each person to photograph one animal. Which person photographed which animal?

Description of Learning Activities:

Students are asked to read the 3 clues presented below. Working with a partner they will create a fourth clue that will enable them to match each person with the animal they photographed.

	Molly	Jeff	Leo	Sally	Livingston
Elephant					
Zebra					
Leopard					
Vulture					
Boa Constrictor					

1. Neither Jeff nor Leo like snakes or birds.

2. Sally dislikes elephants and boa constrictors, and she can't understand why Livingston and Molly like these animals.

3. Jeff used black and white film to photograph the zebra.

Answers: Molly-Elephant or Boa Constrictor

Jeff-Zebra Leo-Leopard

Sally-Vulture

Livingston-Boa Constrictor

Unit: Mystery

Grade Level: 1-6

Title of Lesson: Astonish Me!

Cognitive level(s): Analysis, Synthesis, Aesthetic Evaluation

Skill: Observing, interpreting, making inferences, fluency, flexibility, originality, elaboration

Objective: Students will observe and discuss the works of artist Rene' Magritte and will create a locker using the element of surprise based on their interpretation of Magritte's style.

Description of Learning Activities:

1. Present pictures or posters of Rene' Magrittes' work to the students. Ask them questions such as:

How do you feel when you are taken by surprise?

What do you notice that is surprising in this picture?

How did Magritte combine objects and scenery to create an unusual effect?

Try using SCAMPER to analyze his work! (Example: Magritte's "The Listening Chamber presents a giant apple which is so large it completely fills a room. This apple which almost touches the ceiling and all four walls is an example of magnifying an object.

2. Show students "your locker" which has been created by folding a 12" X 18" or 18" x 24" piece of drawing paper in half lengthwise. The outside may be decorated to resemble an actual locker.

Ask students to brainstorm what might be in your locker. Record all responses. Briefly discuss what might really be inside and then open the locker. (Have a surprising object) or combination of objects inside.

Relate this to Magritte's work and how he used the element of surprise in creating his paintings.

3. Students will create their lockers using large white or manila drawing paper. The front of the locker is to be realistic. The inside of the locker is to contain something unusual so that the person opening it will be surprised!

4. Students will take turns sharing their lockers. If time allows they can briefly brainstorm what might be inside before each locker is opened. Examples of locker contents of SAGE students included: a piano, The First National Bank, a snowman, a washing machine, an outer space scene, a computer, a fish tank, etc.

Unit: Mystery

Grade level: 1-6

Title of Lesson: Suspense!

Cognitive Level(s): Analysis, Synthesis, Evaluation

Skill: Creative Problem-solving

Objective: Students, in small groups, will describe the scenario picture, creating an aura of suspense for the listeners. Each group will present the boy's problem and formulate a problem statement such as "In What Ways Might We Rescue the Boy?"

Introductions: Show students a mysterious picture and ask them to describe what might be happening. How was a feeling of suspense created?

Show the picture of the man and the boy. (Pictures can be made into overheads.) Ask the students to work in detective teams to develop the story that leads to this picture. (Fact-Finding) Groups will share stories.

Description of Learning Activities:

1. Through brainstorming each team will be asked to hypothesize what the real problem might be. They will complete the following statement which is presented on large chart paper, "In What Ways Might He...(either the man or the boy)

Ex. In What Ways Might The Man Help the Boy?

2. Teams will brainstorm a list of possible solutions and then select 3 criteria to evaluate 3-5 of their solutions (See pp. 35- 40 of SAGE Training Manual for specifics).

3. When the solution has been determined have the students develop a brief action plan with a timeline to solve the problem.

Extension idea: If there is time, students can role-play the situation, stop at the scene in the picture to generate solutions from other students and then present their solution and action plan.

Appendix H

Sage Implementation Plan

and

Evaluation Forms

SAGE IMPLEMENTATION PLAN

NAME ______________________ SCHOOL ____________________

TRAINING DATES ______________________

Please respond to the following questions to indicate how you plan to implement the SAGE Program. Use the reverse side of the page if necessary.

When do you plan to start using the SAGE Tri-Fold Curriculum?

How will you use this program in your school situation?

Which model will be implemented?

Which students will you affect with this program?

How much time will be spent on teaching higher order thinking skills each week? (Approximate number of hours or minutes)

How will you identify a target population?

Will this be used to supplement an existing program? (If so, please briefly describe existing program.)

List the parts of the SAGE Program that you will be using.

Who will be the key people (i.e. G/T coordinator, classroom teacher, etc.)?

Describe how you plan to evaluate the impact of the program in your system. (i.e. using the SAGE evaluation procedures, using your own format - please explain.)

What type of aid would be helpful to you as you begin to implement the SAGE Program? (Are there any problems you foresee in using the Tri-Fold Curriculum? If so, please explain.)

Comments/Suggestions - (Please feel free to add anything to enable us to help you have a successful adoption of the SAGE Program.)

Evaluation

The SAGE Program has installed a comprehensive evaluation system. The goals of the program include development of critical thinking and higher cognitive abilities in order to bring about increased academic achievement. To test the effectiveness of the program, a pre/post testing model is implemented utilizing the following measures.

Test of Cognitive Skills	Grades 1-3
Ross Test of Higher Cognitive Abilities	Grades 4-6
Comprehensive Test of Basic Skills	Grades 1-6
Cornell Critical Thinking	Grades 4-6

The complete SAGE evaluation process is contained in our evaluation manual which can be ordered under a separate cover.

In addition to the pre/post testing, the report card which follows allows the SAGE teachers to provide feedback to parents twice a year. This reporting system focuses on daily performance, rating students on a scale from commendable to improvement needed.

Student self-evaluation is completed on a continual basis. Students help to determine criteria based upon the given assignment and are able to rate themselves as well as their peers as to the degree of success demonstrated in meeting the stated criteria.

SAGE Progress Report

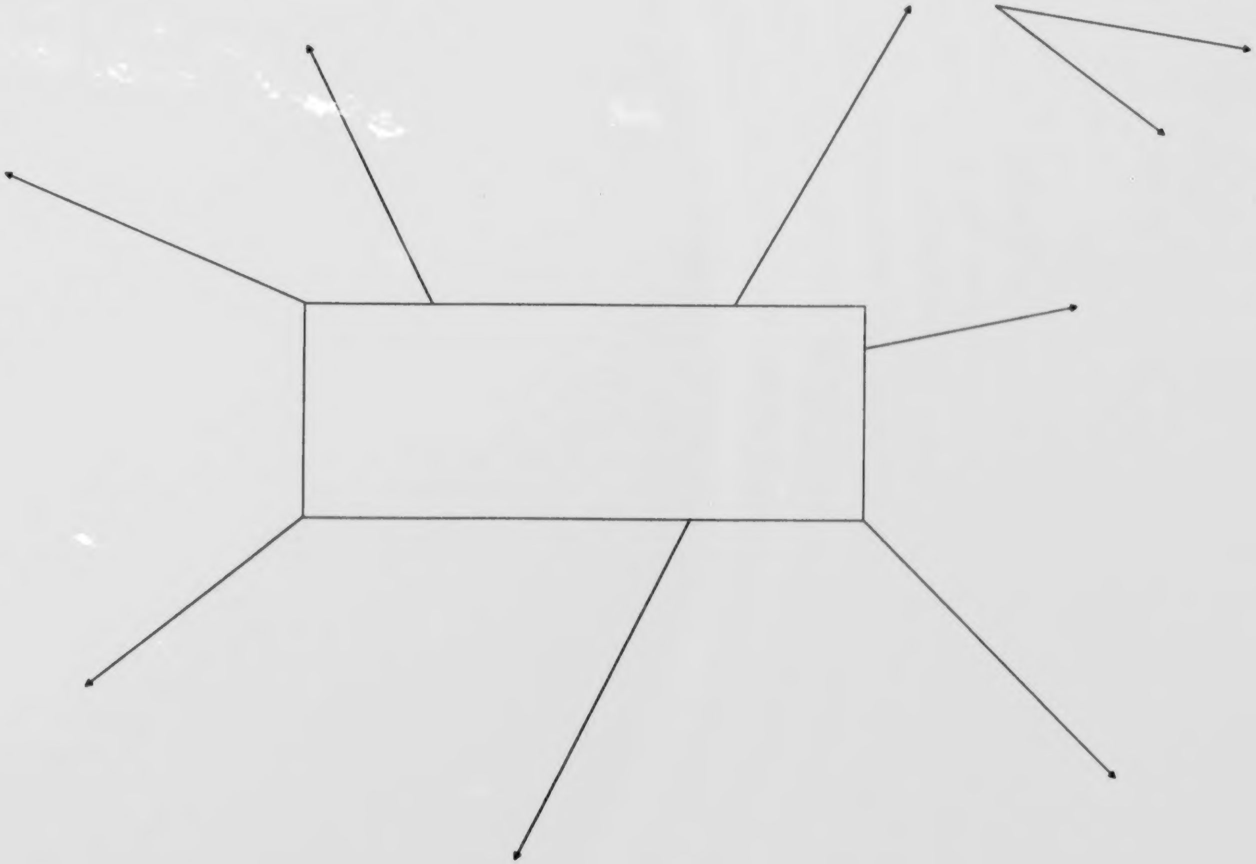
Student: ______________________________

Date: ______________________________

N/A = Not Applicable
CP = Commendable Progress
SP = Satisfactory Progress
I = Improvement Needed

	CP	SP	I
Works Independently.			
Develops useful organizational skills, structure, styles and strategies to reach an end result.			
Uses a variety of resources for research and exploration.			
Inquires critically into problem-solving situations.			
Able to see beyond the obvious, surpassing literal interpretations.			
Is able to show an original plan of operation that is based on minimal specifications.			
Profits by learning from past errors.			
Exhibits verbal fluency and flexibility.			
Exhiits written fluency and flexibility.			
Applies the skill of brainstorming to elaborate on ideas.			

	CP	SP	I
Is able to elaborate verbally and non-verbally and create original products, i.e., plays, stories, skits.			
Is able to grasp cause-effect relationships.			
Displays curiosity about a wide variety of topics; follows up with self-initiated study of same area.			
Extends assignment beyond classroom expectations.			
Breaks down complicated/lengthy tasks into workable components.			
Can perceive figural, verbal, and spatial relations.			
Can draw conclusions based upon the use of deductive reasoning and inferential skills.			
Can extend/incorporate others' ideas to extend his/her own.			
Demonstrated responsibility in completing and passing in assignments.			



Webbing a Topic

Planning Sheet

Unit:

Grade Level:

Title of Lesson:

Cognitive Level(s):

Skill:

Objective:

Introduction: (Motivation)

Appendix I

Bibliography

BIBLIOGRAPHY

Baldwin, A.Y., Gear, G.H., Lucito, L.J. (Eds.), *Educational Planning for the Gifted*, Reston, VA: Council for Exceptional Children, 1978.

Bloom, B.S. (Ed.), *Taxonomy of Educational Objectives*, New York, NY: McKay, 1974.

Davis, G.A. and Rimm, S., *Education of the Gifted and Talented*, Englewood Cliffs, NJ: Prentice Hall, 1985.

Feldhusen, J.F., and Treffinger, D.J., *Creative Thinking and Problem Solving in Gifted Education*, Dubuque, IA: Kendall/Hunt, 1980.

Gallagher, J.J., *Teaching the Gifted Child* (2nd ed.), Bost, MA: Allyn and Bacon, 1975.

Gowan, J.C., Khatena, J., and Torrance, E.P. (Eds.), *Creativity: Its Educational Implications* (2nd ed.), Dubuque, IA: Kendall/Hunt, 1981.

Guilford, J.P., *The Nature of Human Intelligence*, New York, NY: McGraw-Hill, 1967.

Hartman, R.K., *Scale for Rating the Behavioral Characteristics of Superior Students,* Mansfield, CT: Creative Learning Press, 1978.

Kaplan, S.N., *Providing Programs for Gifted and Talented*, Ventura, CA: Office of the Ventura County Superintendent of Schools, 1974.

Maker, C.J., *Curriculum Development for the Gifted*, Rockville, MD: Aspen, 1982.

Meeker, M., *The Structure of the Intellect: Its Interpretations and Uses,* Columbus, OH: Charles E. Merrill, 1969.

Newland, T.E., *The Gifted in Socio-Educational Perspective*, Englewood Cliffs, NJ: Prentice Hall, 1976.

Osborn, A.F., *Applied Imagination* (3rd ed.) New York, NY: Scribner's, 1963.

Parnes, S.J., Noller, R.B., and Biondi, A.M., *Guide to Creative Action*, New York, NY: Scribner's 1977.

Piaget, Jean and Barbel Inhelder, *The Psychology of the Child*, Basic Books, Inc.: New York, 1969.

Renzulli, J.S., *The Enrichment Triad Model: A Guide for Developing Defensible Programs for the Gifted and Talented,* Mansfield, CT: Creative Learning Press, 1977.

Sato, I.S., *"Developing a Scope and Sequence for Gifted/Talented Students,"* presented as a mini-course at NTSI/GT Eastern Institute, Bost, MA: Emmanuel College, June 1985.

Segoe, M.V., *Terman and the Gifted,* Los Altos, CA: Kaufman, 1975.

Shallcross, D.J., *Teaching Creative Behavior,* Englewood Cliffs, NJ: Prentice-Hall, 1981.

Torrence, E.P., *Guiding Creative Talent,* Englewood Cliffs, NJ: Prentice-Hall, 1962.

Tuttle, Frederick, B., Jr., *Characteristics and Identification of Gifted and Talented Students,* National Education Association: Washington, D.C., 1980.

Treffinger, D.J., *"Teaching for Self-Directed Learning: A Priority for Gifted and Talented,"* Gifted Child Quarterly, 1975.

Wooster, J., *What To Do With The Gifted Few*, East Aurora, NY: D.O.K. Publishers, 1978.

Whimby, A. and Lockhead, J., *Problem Solving and Comprehension*, Philadelphia, PA: Franklin Institute Press, 1982.

Williams, F., *Classroom Ideas for Encouraging Thinking and Feeling*, Buffalo, NY: DOK Publishers, 1970.

EVALUATION GUIDE

Kerlinger, F., *Foundations of Behavioral Research* (2nd ed.), New York, NY: Holt, Reinhart and Winston, 1973.

RMC Corporation, *Evaluating Title I Programs*, Hampton, NH: RMC Corporation, 1978.

Project Sage

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Preface

This book is a compilation of mini-study units developed by educational practitioners and other Sage Program adopters. The Sage program, developed and tested in the public schools of Framingham, MA., has been designed to develop student's higher level thinking skills and to improve their academic achievement by providing specialized curriculum for gifted and talented children in the first through fifth grade elementary schools. Mini-unit studies provide enrichment materials offering resources and background information not available through the regular curriculum. The units are interdisciplinary in nature and incorporate thinking skill activities in broad topic areas.

Users of this book should feel free to copy or hand out any or all of the worksheet or activity parts of these units for use in classroom instructional settings. Although the units are organized into five sections—Science, Literature, Social Studies, Art, and Miscellaneusus—users should also feel free to utilize this information for instructional purposes in any order they desire.

We hope to provide additional Sage study units on a yearly basis and will welcome ideas for future units that would complement the information in this study.

We would like to express our appreciation to all those educational practitioners who have contributed to this project.

Project Directors:

Diane Modest

Sandra Cymerman

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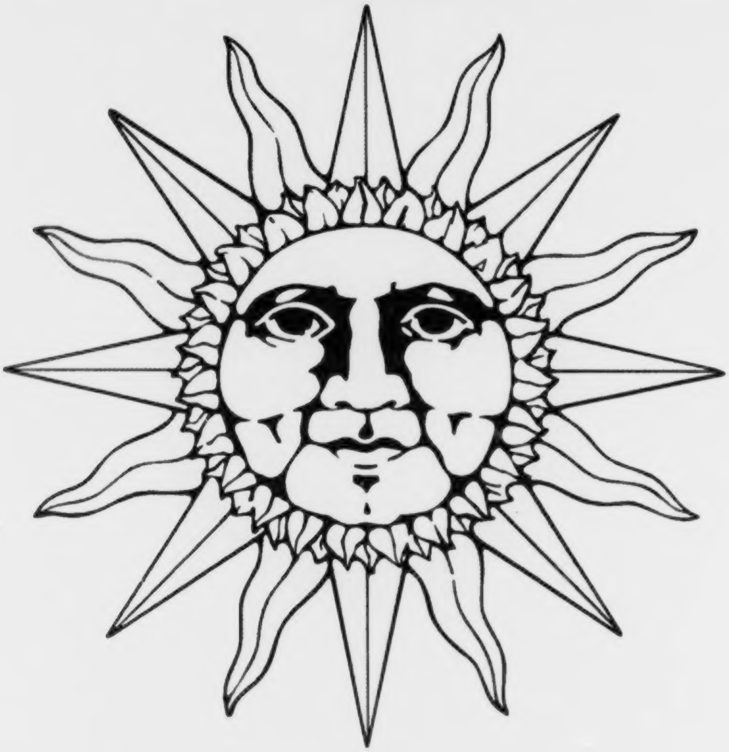
ALTERNATIVE ENERGY SOURCES



PROJECT SAGE

OVERVIEW

NOTE: To present this unit in its entirety, the following materials are recommended for purchase from Resources for the Gifted, Inc., 3421 North 44th Street, Phoenix, Arizona 850181:

1. Solar Greenhouse
2. Solar Power Activities
3. Solar Oven4 Solar Energy Lab

The workbooks and kits listed above, provide excellent hands-on investigations and experimentation in solar energy. These unique supplementary activities have added much to our mini-study unit on Alternate Energy Sources.

We are faced with an energy crisis that exists now and will exist for decades to come. Conservation will have an important impact; however, alternate sources of energy such as solar, wind, tide, nuclear, and geo-thermal power must continue to be explored and researched.

The survival of any society is dependent upon its study of the future. Predictions of the future in assessing technology and projecting where it will lead are major components of this problem-solving unit.

PROCEDURES

The activities in this unit are two-fold:

1. Using research skills, students will determine and rate possible alternatives for the production of energy.
2. Students will focus on and explore the variety of uses of the sun's energy in problem-solving activities.

OBJECTIVES

Students will:

- ☐ define energy alternatives;
- ☐ compare and contrast the pros and cons of alternative energy sources;
- ☐ know the function of solar energy;
- ☐ know the function of nuclear energy;
- ☐ be able to investigate problems related to today's energy conversation issues through research, experimentation, data collection, synthesis and evaluation;
- ☐ learn that, although problem solving can be complex, they can seek answers in an informative and successful way;
- ☐ apply creativity (fluency, flexibility, originality) to elaborate about relevant contemporary energy problems;
- ☐ be exposed to and offer solutions to real-life situations;
- ☐ learn the environmental impact of nuclear energy;
- ☐ learn decision-making techniques to deal with the training of people for the design and implementation of energy conservation programs;
- ☐ conduct surveys, collect data and evaluate the results;
- ☐ utilize their artistic, musical and creative writing abilities;
- ☐ predict future energy production;
- ☐ learn all facets of the utilization of solar power through experimentation and record-keeping;
- ☐ observe the conditions under which plants prosper, utilizing a solar greenhouse;
- ☐ devise recipes to be used in a solar cooker;
- ☐ invent ways to convert light into electricity using the sun;
- ☐ associate their knowledge of solar power with the implementation of future space programs;
- ☐ share research, experimentation and original creations with peers and interested audiences.

RESEARCH QUESTIONS

Research questions and activities can be presented in a learning center fashion. Students should select at least one research question and one activity to pursue. Students may work individually or in small groups. Small groups are suggested for skits.

1. Consider the current means of energy production. Construct a list or chart.
2. Judge the possible alternatives for producing energy. Develop a rating scale.
3. "Some pollution problems could be prevented by the use of coal as fuel." Investigate this statement. Is it valid? Present pros and cons of this issue.
4. Is it financially feasible to:
    a. convert coal into gas?
    b. extract oil from shale?
    c. convert solar energy?
    d. use geo-thermal energy to operate windmills?

5. Identify problems incurred by the use of nuclear reactors.
6. What problems does off-shore, oil-drilling pose?
7. What impact does alternative energy production have on the environment?
8. Are there any special interest groups that might interfere with solutions to the energy problems?
9. What savings are made through use of nuclear energy.

ACTIVITIES

On each card, copy the corresponding activity and give one card to each student, or to a group of students, hand out several cards that contain activities, or use your own imagination to decide how to use the cards.

Card 1 Have students act as the head of the U. S. Safety Commission, your mission is to deal with the nation's concern for the improper disposal of nuclear waste.

How will you deal with this problem?

What were your major findings?

What alternatives were you able to find for the disposal of nuclear waste?

Card 2 Have students act as the head instructor at the Seabrooke Station training center. Your job is demanding because it requires that you train and re-train men and women to learn the proper operator skills of the power plant. To make your job of training operators easier, design a handbook containing all pertinent information.

Card 3 Conduct a survey of the number of people in your community who have already begun to conserve fuel. Include the ways in which fuel is being conserved.

Card 4 Plan a film-strip that describes the ways that people can conserve energy.

Card 5 Create a series of posters that explain the effects of nuclear energy, coal and strip mining on the environment.

Card 6 Design a home that will be equipped with your selection of the ultimate energy source.

Card 7 Design a unique mode of transportation that will enable drivers to use an alternate source of fuel.

Card 8 Debate: Nuclear vs. Solar energy (Debating packet).

Card 9 Write a contemporary song that addresses the energy conservation issue.

Card 10 Our planet is quickly becoming over-populated, and we will soon have to inhabit some other space, be it water or other planets. Energy in these environments will be of major concern. Plan ahead. Avoid these problems of overpopulation and in a space or world of your choice, devise a system to solve these problems.

Card 11 Create and present a skit, demonstrating an accident at a nuclear power plant. Make it an original production.

Card 12 Students should complete all four packets. Four stations can be set up as centers where students may use materials.

HANDS-ON EXPERIMENTS

Divide the class into three groups. Each group should do a greenhouse, cooker, or electricity convertor transmission project. Final group projects should be shared.

1. Solar Power Experiment (Activity) Packets

   A. Absorption: How to absorb and collect solar power.

      Does it work?

      Is it efficient?

      How does one measure solar power?

      How does one record the data, once received?

      Comparison of solar power to other ways of energy collection

   B. Retention

      After you've collected solar power, how is it contained?

      What is the most efficient type of container?

      How does color affect the retention of solar power?

      What is insulation, and how is it a part of solar retention?

C. Reflection

Once you have collected and retained solar power, what are its uses? How does solar power affect time?

How does solar power affect cooking?

How does it affect the position and alitude of the sun in the sky?

D. Transmission

How much solar power can be transmitted?

Can solar power be used to obtain water from the ground?

What is the greenhouse effect?

Does the color of light collected make a difference?

2. How To Bottle The Sun's Energy

A. The Solar Greenhouse
(see following attachment)

The Solar Greenhouse Experimentation Kit includes experiments that show how to control solar energy to grow plants successfullyand addresses concepts such as:

-too much vs.
not enough energy

-color

-soil

-light

-moisture

-hydroponics

Concepts are presented to raise thought-provoking questions and problems.

B. The Solar Cooker

Experiment with the solar cooker, using various, readily available foods from home. Concoct creative cookery and construct a class conglomeration of culinary delights (recipes). As a class, edit and prepare the cookbook for press. Who knows, you may have created a gastronomical energy, efficient #1 Best Seller.

3. Solar Energy Inventors Kit

The solar energy inventor's kit allows the students to convert energy. The activities help students experience how to convert energy and at the same time create their own solar designs. It also allows further investigation of the solar cell and could serve as a stimulus to the study of our space program's satellite and lunar operations. In addition, it provides a basic foundation for understanding the uses of solar energy. Students should try these experiments before doing their own.

SOLAR GREENHOUSE IDEA BOOK

Aren't all greenhouses solar? Don't they make use of heat and light from the sun to promote plant growth?

Of course they do! But Old Sol doesn't garden enough to understand that plants need just the right amount of heat and light for good health. Too much heat and light produces *fried flowers*, too little, *plantsicles*.

Basic preparation of the greenhouse is very simple:

☐ Trays should be filled to within one inch of the top with a soil and sand mixture. Two-thirds of this mixture should be commercial potting soil (if good black dirt is not available) and the remaining one-third should be sand.

☐ After filling the trays, moisten the soil thoroughly. Make shallow holes in the soil and drop two or three seeds into each one. Cover the seeds with, at most, one-half inch of soil.

☐ When watering plants, add water slowly and gently to avoid washing the soil away from the seeds. Be careful not to over-water. Your moisture meter will be a good guide to proper watering.

☐ To assemble tents, insert support rods through casings on the edges of the tents. When planting is completed, position rods in the corner holes of the trays. When plants are betweem two and three inches high, you may want to remove some of them to avoid overcrowding.

Four factors affecting plant growth are:

-light and Color
-nourishment and soil
-moisture
-temperature

The activities in this book provide ideas for project experiments and investigations with plants and solar energy. To obtain ideal growing conditions within the greenhouses, the light and heat energy must be regulated in some way.

Light

To evaluate the solar–effect on seed germination (sprouting), prepare both greenhouses exactly the same using the same types of soil and seeds, and the same amounts of water. Place the planted greenhouses in direct light but not in direct sunlight. Observe both greenhouses daily.

Which seeds first?

Is there a difference in the rate of growth of seedlings?

How about the number of leaves? General appearance?

Keep a chart of your observations to help you make evaluations.

What will plants do when solar energy is limited to small concentrated areas?

Design a "holey" board from cardpaper or heavy paper. Make about five random holes in your board and cut it to fit the top of the planting tray. Tape the edges down to keep it in position. The board can be lifted for watering and carefully replaced in position. What do plants do in this case?

Can you predict the results if you cover all but one of the holes?

What happens when growing seedlings meet an obstacle in their path of growth?

When seedlings have almost reached the top edge of the planting tray, lay a piece of cardboard about four inches wide across the top of the planting tray. It should go across the tips of the plants and be taped to keep it in position. Observe the behavior of the plants when they meet this obstacle. Try a little experiment with heliotropism.

When seedlings in both trays have developed several leaves, make some little foil caps to cover the tips of the leaves in one of the greenhouses. Turn the plants so the leaves are facing away from the sun. In the other greenhouse, cover the leaves with foil shirts leaving the tips exposed. Turn these plants away from the sun also.

Observe the plant behavior over a three-day period, taking care not to change the position of the greenhouse during this time.

Do your observations lead you to some conclusions about heliotropism?

Does 24 hour exposure to light make a noticeable difference in the rate of plant growth?

Plant both greenhouses in identical conditions. Keep one greenhouse lighted at all times, using artificial light when necessary. The other should be exposed to light only during daylight hours.

Does the amount of time make a difference? In one weeks growth? Two weeks?

Color

Do plants have favorite colors?

Do they grow better in colored light? If so, what color?

Use the polythane sheets to test the effects of colored light on plant growth. Plant both greenhouses exactly the same. Place the colored sheets over the tent of one greenhouse and tape it in place. The other greenhouse can be left clear or covered with another color to more easily compare the greenhouses. You can achieve other colors by combining two polythane sheets on the same greenhouse.

Does color affect the growth or general appearance of plants?

How would you explain your answer?

What evidence did you observe to support your conclusion about the effects of color?

How much effect does the greenhouse structure have on moisture retention?

After planting both greenhouses, add an equal amount of water to the soil of each planting tray. Insert the moisture indicators into the soil. Place a tent over one tray, leave the other uncovered. Keep a daily check on the moisture indicators.

How long does the indicator in the uncovered tray, register "moist"?

How about the covered one? Is there a noticeable difference in plant growth?

What would happen if you watered plants with soda water? Dissolve baking soda in tap water or use bottled soda water to try it. Prepare both greenhouses the same. Water one with soda water, the other with an equal amount of tap water. Continue watering in this manner.

Is there a difference in the appearance of the plants after two weeks? Can you explain?

Sprout some seeds by wrapping them in wet cotton, keeping them moist for at least a week. Plug the hole in a small clay pot (modeling clay makes a good plug) and push it into the soil in the center of a planting tray. Fill the pot with water, keeping the rest of the soil dry. Plant the roots of the seeds in the soil around the pot, leaving the seed on the surface. After a few days, carefully brush the soil away from the roots.

Do you see a growth pattern?

Soil

Experiment with various kinds and combinations of soil. Some suggestions might be potting soil only, half potting soil and half sand, pebbles and soil. A different combination can be used in each greenhouse. If the type of seeds and amount of water and light are kept the same for both containers, an evaluation of the soils can be made.

Will earthworms improve the soil conditions? Once seedlings are about two inches high in both greenhouses, add a few earthworms to one of the planting trays. Leave the other wormless. Keep all other conditions equal and see if you notice any differences in plant growth in the two greenhouses.

What results would occur if you used sponge in place of soil?

What other material might be used in place of soil?

Can you find materials to insulate the planting trays of your greenhouse in cold weather conditions?

Use your thermometer to measure solar heat retention of soil.

Hydroponics

Hydroponic gardening is the growing of plants without soil. Vermiculite, which is small chunks of mica or plain gravel, is often used instead of soil. Additional vermiculite can be purchased at any garden supply store. Fill both trays with vermiculite or gravel. Spread the seeds over the top. Water one tray with plain tap water, the other with water containing liquid or powdered fertilizer. Keep careful records of plant growth (height, color, number of leaves general appearance) in each greenhouse.

Any conclusions?

Compare the results of plant growth for a hydroponic greenhouse and for one with soil. Some hydroponic greenhouses use a siphon water system to prevent water from standing in the tray. This system gets water to the plant roots and removes any excess for future use. By evaluating one end of the planter and finding a few simple items, you can design a simple siphon system for your hydroponic garden. Plants are usually watered twice a day when the siphon system is used.

Does this provide for healthier plants than if the water is allowed to sit in the tray?

How would you evaluate the results of each method?

General

Which part of a plant grows the fastest? When a plant has reached a height of about two inches, carefully mark the stem in quarter inch spaces from the soil surface to the tip of the growing plant. Use a permanent marking pen and a gentle touch. You can tell where the greatest growth takes place by observing changes in the measured spaces.

When roots meet an obstacle in their path, what do they do? Bury a block of wood about two inches below the soil surface. Set a seedling into the soil so the roots are just above the wood block. After a few days, gently brush the soil away to observe the roots. Continue checking every few days, pressing the soil back in place with care each time.

What do the roots do when they meet an obstacle?

Do plants object to overcrowding? Think of the greenhouse as being divided into four sections. Plant seeds in one section, 1 inch apart, the other sections— 1 and 1/2 inches, 2 inches, and 2 and 1/2 inches apart.

Is there a difference in germination time?

How do the plants in the sections compare with each other in rate of growth, general appearance and number of leaves?

Any conclusions?

Does it make any difference how deep seeds are planted? Plant one row of seeds two inches below the soil surface, another, one inch below, and another, a third of an inch below.

What were the results? Does it make a difference?

If you add food coloring to the water before you pour it into the planter, will there be any visible effect on your plants?

Gather all types of seeds for experimental plantings–weeds you pass on the way to school, seeds from fruit and vegetables you eat, birdseed, grass seed, alfalfa.

Try starting new plants from cuttings (small stems from mature plants). With a sharp knife or scissors, remove a healthy stem from the parent plant. Place the cutting in water until the roots begin to appear. Transplant this rooted section to your greenhouse and continue to give it tender, loving care!

Most houseplants are quite willing to grow from cuttings.

If you plant rye grass, the grass can serve as the basis for a mini-ecosystem. Once the grass is about two inches high, insects can be introduced into the greenhouse. They will use the grass as a food source.

What larger insect could be introduced to use these insects as a food source?

How many other predators could be added to your system?

The growth response of a plant to conditions in the environment is called a *tropism*. The following is a list of these tropisms:

hydrotropism - The tendency of plant roots to grow toward water.

phototropism - The tendency of plants to grow toward light.

geotropism - The tendency of plants to change their direction of growth in response to gravity.

heliotropism - The tendency of plant leaves to turn toward the sun or away from a source of injury.

What name would you give to the tendency of plants to respond to music?

How about the tendency to respond to the human voice?

Will plants respond to magnetism? If so, what would be a good name for this tendency?

SOLAR COOKER

1. Place food on skewer and wrap with solar foil. Wrap foil, black side out. Fold top and side edges tightly to avoid dripping.
2. Place skewer in cooker. Rotate skewer so foil seam is as near to top as possible. Locate in skewer lock.
3. Focus the cooker. Adjust the cooker until the pinpoint of light shining through the hole in tracking cell falls on the center of the red target.
4. Using The Solar Cooker

   Cooking times are normally about 10-15 minutes for a high Sun. The Cooker should be refocused every 20 minutes. If dripping occurs, the reflector is easily cleaned with a mild detergent and soft cloth or sponge. Never use abrasive. Use only solar foil. Ordinary cooking foil will not work.

Old Sol's Cooking Suggestions:

Min-Shish:	Arrange pieces of tender beef between baby tomatoes, fresh mushrooms, and slices of green pepper and onion. Slosh with wine, salt, pepper, cayenne and oregano.
Conglomerate:	A little lamb, sweet pepper, new potato, artichoke hearts, small onions, and eggplant. Go Japanese with soy, oil, and lemon juice marinate.
Sea-Shish:	Any combination of prawns, crab or lobster chunks with tomato and mushroom. Brush with a rich butter and lemon sauce , very gooey dessert marshmallow, apple, banana, pineapple slices, and strawberries, sprinkled with brown sugar, water, and coconut flakes.
Sun Dog:	Two juicy hot dogs or genuine bratwurst. Cover with cheese, relish, sugar, vinegar, and chopped onions.

LET'S MAKE A SOLAR TOP

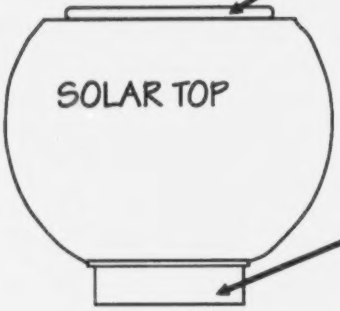
Solar cell under clear plastic cap powers a 1.5 volt motor that spins toy top when placed in the sunlight.

Body of top is made from a ball of styro-foam that you can buy at most dime stores.

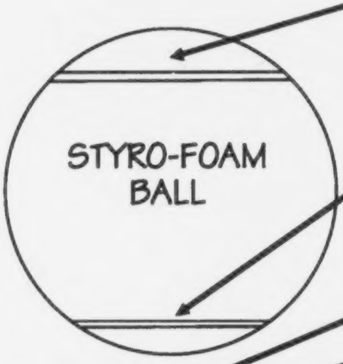
Wooden disk– forms base that holds top up as it spins.

The top of the ball of styro-foam is cut off with a sharp knife making a flat surface for solar cell to rest on.

Bottom of ball is cut off as shown for fitting base section and for making pocket for holding monitor.



Clear plastic cap is used for fitting over the solar cell for protection. Knife would cut around cap so that it can be pushed down into styro-foam to protect solar cell.



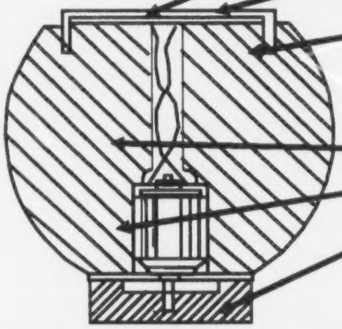
Solar Cell Under Cap

Styro-foam section is cut in half in this drawing showing how motor is fitted in.

Hole cut through center for fitting wires, and pocket cut for fitting in motor. Use Elmer's glue to glue in motor.

Base can be made of wood or plastic having small hole drilled for fitting shaft of motor where it is glued.

(Do not use plastic glue on Styro-foam part must be water type glue.)



NOTE: A patent on this product is pending.

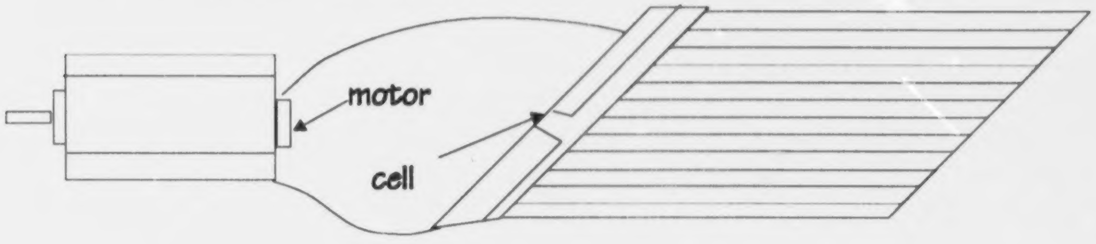
SOLAR ENERGY INVENTOR'S KIT

Congratulation's Inventor! You are now the proud owner of a Solar Energy Inventor's Kit! With this kit you will be able to build and experience one of the most advanced concepts of energy, called protons. When these protons strike the surface of the solar cell, a charge is formed eliminating the need for batteries. The solar cell has been used extensively in our space program powering various phases of satellite and lunar operations. You may look forward to battery-free, crank-free performance from these cells.

Important Characteristics for Handling and Working with Solar Cells

1. **SOLDER RED (+) WIRE** to either solid bar on top of cell. IMPORTANT: Wire should be positioned in such a way that the exposed or stripped portion of wire does not contact outer edge of cell. Bare wire contacting the outer edge of the cell will result in a short, and hence, no power. (See Diagram 1)

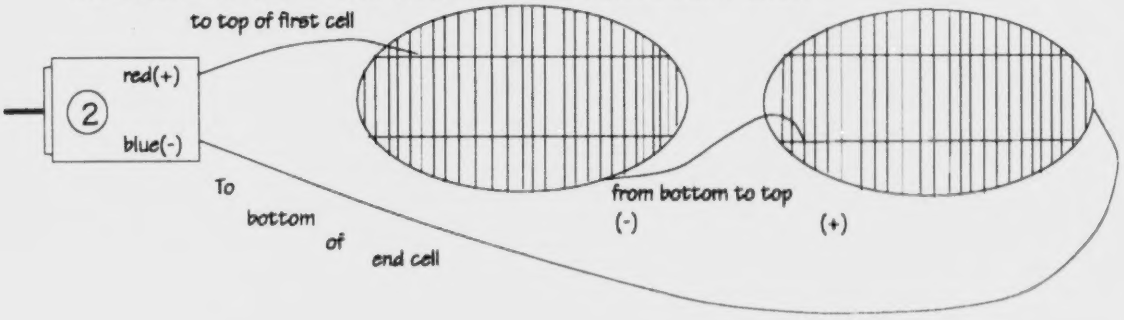
Soldering motor to cell
solder to either bar on top of cell.



Solder to metallic area under side.

SOLDER BLUE 9 (-) WIRE to any location within the metallic area on reverse of cell. IMPORTANT: Do not use excessive pressure or prolonged heat from soldering iron when making this connection. Remember, these cells are very fragile. (See Diagram 1)

SOLDERING MOTOR TO TWO OR MORE CELLS FOR ADDED POWER



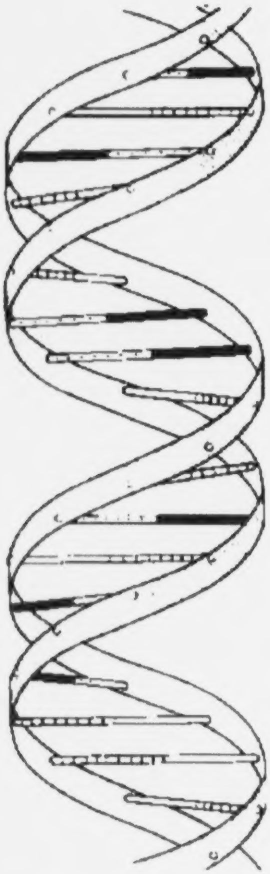
One solar cell will adequately power the 1.5 volt motor, two properly wired cells will give motor significantly more drive and load carrying capabilities. Be creative! Put the sun to work for you! Included are all necessary parts for solar drive.

This kit contains the basic parts of a drive train which you may utilize in constructing your own solar design. These parts will enable you to convert an existing non-powered toy or some C-battery powered toys into solar powered systems.

IMPORTANT: Choose an adaptable toy for your solar conversion or build a frame from scratch, using the included crown gear, axle gear, axle and wheels. Choosing a lightweight toy, or using a lightweight material (such as balsa wood or plastic) for your frame will give your solar vehicle more velocity and torque.

Also included in this kit are some very basic hints and short-cuts in constructing your solar design. The jeep, truck and beanie are some ideas, but be creative! See what you can power from energy released from the sun!

GENETICS



PROJECT SAGE

OVERVIEW

Language arts are integrated into the lesson by a discussion of the words *gene* and *genetics* —their root word *gen* meaning natural, *to produce, to beget*. Students are asked to generate other words with the *"gen" root*. Their meanings and relationship to the root word should be discussed.

Some "gen" words: genius, genre, gentle, gentleman, genus general, genuine, generate, generation, generous, genial, genealogy. Also a suffix: oxygen, hydrogen.

OBJECTIVES

This unit introduces the student to the life science of Genetics, the processes of inheritance, and the intricacies of Nature's system of engineering. It is designed for a pre-adolescent age group (10-11 year-olds) and is not a sex education unit, although it could be used as an introductory unit to the study of human sexuality, as there is obviously a link between genetics and human sexuality. This unit can also be used in conjunction with the study of the human body and the study of the cell, or basic life forms.

PROCEDURE

PreTest

Students are asked to define: *gene, genetics, DNA, chromosome, meiosis and mitosis.* A post-test, which includes questions about these terms should be administered following the unit (see post-test included).

GENETICS WORD SEARCH PUZZLE

E	L	A	M	E	F	A	U	R	X	A	Y
T	M	L	O	M	E	N	D	E	L	J	N
E	F	E	D	O	I	R	W	C	T	X	K
M	N	X	I	S	Z	T	G	E	N	E	M
A	O	R	V	O	A	N	O	S	A	S	O
G	I	A	I	M	S	E	R	S	N	L	P
X	T	Y	S	O	A	I	P	I	I	Y	H
Y	A	E	I	R	L	L	S	V	M	S	I
L	T	R	O	H	S	L	E	E	O	T	D
M	U	O	N	C	S	L	A	N	D	I	E
S	M	P	T	I	R	E	Q	T	T	A	R
O	V	S	U	E	L	C	U	N	A	R	D
N	E	X	P	E	R	I	M	E	N	T	C
N	O	I	T	A	R	E	N	E	G	G	E

Can You Find These Words?

mutation
Mendel
female
sex
RNA
experiment

egg
rat
traits
peas
gamete
generation

nucleus
cell
chromosome
short
tall
dominant
recessive
DNA

male
division
X-ray
meiosis
mitosis
spore

THE INITIAL STUDY OF GENETICS

Initial study of genetics centered around Gregor Mendel's work with pea plants in the Brunn Monastery in Austria. Mendel was born on July 22, 1822. He began his work with plants in 1856, and his definitive paper "Experiments with Plant Hybrids" was published in 1866. Mendel died January 6, 1884. It was not until 1918 that Mendel's work was rediscovered, and the value of his findings finally realized by the scientific community.

Instead of telling the students what Mendel discovered, teacher and student should work together to try deducing what Mendel himself deduced about the science of heredity. In this way, the content and process approaches to science education can be meaningfully combined. Using a lecture/discussion format rather than a written text is an excellent approach that will enable students to gain much needed practice in note-taking. Students will need their notes to study for the end-of-unit test, because there is no textbook. Encourage and assist students to take meaningful notes and write down observations, again integrating language arts skills.

A feltboard is used to present visually the Mendelian theory of dominant and recessive genetic traits. The word "trait" is defined as "an individual difference within one species, a characteristic." Differing traits of dogs are brainstormed (long hair, floppy ears, temperament, etc.) to clarify the definition of the word "trait."

The word "gene" is defined as "a body element by which an individual trait or characteristic is transmitted from one generation to the next."

Initial presentation of the Mendelian theory with the feltboard centers around specific traits. The first pea plant trait discussed is flower color. Mendel crossed a red flowering and a white flowering pea. What did he get? Pink. Why? Discuss Mendel's observations, theorize about what caused this to occur, introduce the concept that one-half the genetic material comes from each parent plant.

In the next generation, Mendel crosses the pink hybrid flowers. What does he get? 50% pink, 25% red, 25% white. Why? How can red and white return from pink? Discuss and theorize.

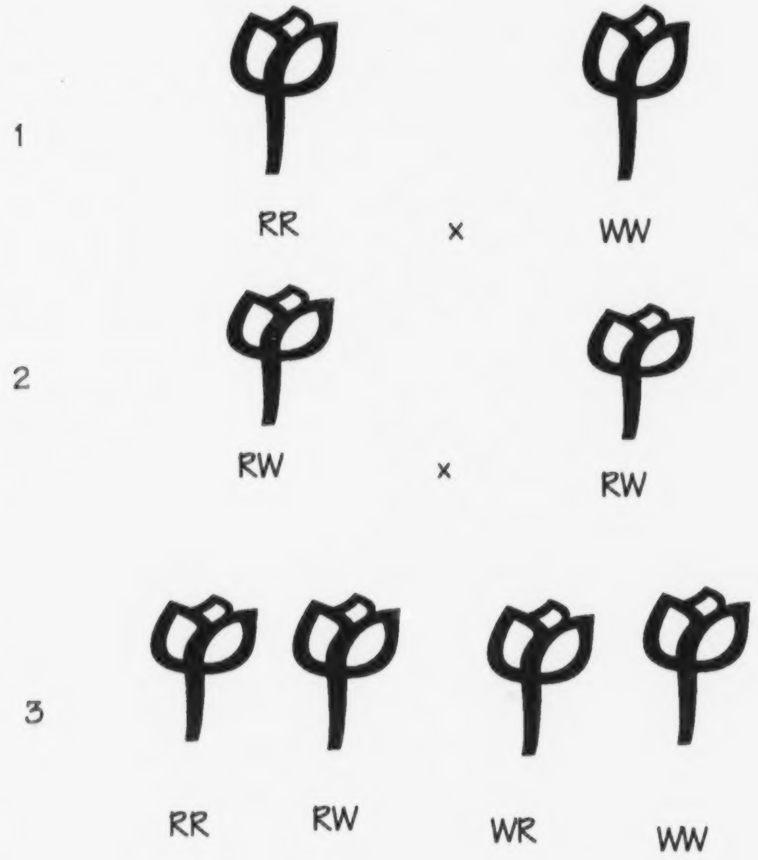
Introduce the symbols used in genetic crosses-letters. Use the combination RW (red/white) for pink rather than pink to reinforce the idea that half the genetic material comes from each parent.

Illustrate with feltboard and blackboard, that in sexual reproduction of plants, the flowers cannot pollinate themselves, but must be cross-pollinated with another plant. When using a feltboard, the number of flowers is potentially confusing. Students should realize that Mendel used hundreds of plants in his experiments. Using blackboard in combination with feltboard is helpful, since the trait can be easily erased once all possible crosses have been made. At this point, feltboard and blackboard should look like this:

Students should be introduced to the terms:

purebred: genetic material for that trait is the same (i.e. red or white flower)

hybrid: genetic material for that trait is different (i.e. pink flower)



Blackboard:

Possible combinations:

RR RW -now erase left R and continue with W

If students understand the concept of crossing where traits have equal dominance, use the feltboard to present the case of the green and yellow pea. Divide lessons according to individual needs of students.

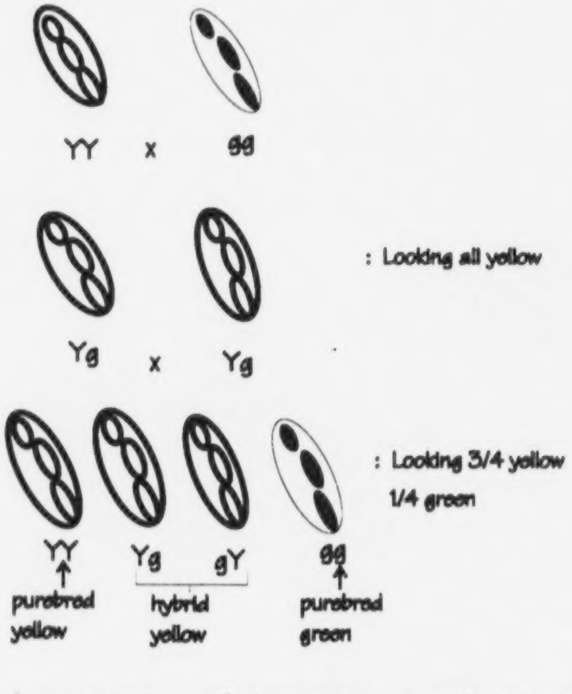
Mendel thought he had the whole thing solved, until he came across traits with peculiar characteristics. He crossed green and yellow pea producing plants, and got plants which only had yellow peas. What happened to the green peas? He crossed tall and short plants and got all tall plants! What happened to the short plants? How could this happen? Students must understand that these plants were not a shade of color between green and yellow, but the yellow peas looked exactly the same as the parent yellow, and the tall plants were as tall as the tall parent plant, not a size between the short and tall plants.

Use felt plants first, then letters. Determine if the use of upper case and lower case letters will help students guess what is happening. Introduce the concept of dominant and recessive.

dominant: totally masks in appearance or function the presence of the recessive gene.

recessive: can only be seen or functioning when purebred, as it is totally masked by a dominant partner

Feltboard should look like this at this point:



On feltboard, arrange the generations of plants one generation at a time and discuss these generations. These diagrams illustrate what the feltboard should look like at the end of the discussion.

ACTIVITIES

On each card, copy the corresponding activities and give one card to each student, or to a group of students, hand out several cards that contain activities.

Card 1 Class Census:

-tongue rolling

-detached/attached ear lobes

-hair/eye color

From a census, attempt to determine if traits are dominant/recessive combination or equal dominance. Pitfall: The class is usually not a statistically reliable sample. You can enlarge a sample by taking a census of another class and combining the results with your class. By using the coin toss activity, you can also illustrate the importance of having a great enough sample.

Card 2 Coin Toss:

Toss two coins together 10 times; note combination heads/heads, heads/tails, tails/tails.

Now toss coins 100 times. Note that the combinations approximate the 3rd generation of pea flowers: 25% heads/heads, 50% heads/tails, 25% tails/tails.

Card 3 Pea Planting:

Plant seeds in milk cartons, using different varieties of dwarf garden peas, (sweet peas of different colors). Note the differences in rate of growth, height and color of the flower or leaf, pea size and shape if peas mature.

Card 4 Radish Sprouting:

Sprout radishes over a damp sponge covered with a damp paper towel. Observe the differences in appearance (color, curl) within one variety.

NOTE: Activities which will show the breeding from one generation to the next, are difficult to do within the elementary classroom. The breeding of plants requires too much time (Mendel spent 10 years breeding plants), fruit flies are difficult to manage and have to be fixed with formaldehyde before their traits can easily be seen. Planting seeds and flowers is strictly for enjoyment and noting of different traits within a species.

HOMEWORK

For homework, have children try crossing of pairs of traits with relationships of equal dominance (fur color of cats for example) and pairs with a dominant/recessive relationship (tongue rolling). Children who like math tend to enjoy trying different combinations. As an example, a cross between a hybrid dominant and a recessive:

Yg x gg	(1) Appearance: 1 yellow, 1 green
Yg Yg gg gg	(2) Appearance: 50% yellow, 50% green

You can't tell from its appearance that the yellow pea was a hybrid, but you can deduce from its offspring that it must be a hybrid, otherwise the second generation would appear to be completely yellow.

ENRICHMENT

You can see a good display of rat generations that have a dominant/recessive relationship of fur color if you visit the Boston Museum of Science.

CELL REPRODUCTION
MITOSIS AND MEIOSIS

To understand why only half the genetic material comes from one parent and half from the other, children should learn about the different types of cell reproduction - mitosis and meiosis. Again, a lecture/discussion format is used, and children should take notes.

Mitosis, or non-sexual cell reproduction, should be discussed first. Talk about the need for an organism to replace dead or damaged cells and to grow. Think of the different types of cells like skin, bone, and blood cells that the human body needs. Discuss what happens if one gest a cut or burn. What does the body need to replace?

Use overhead transparencies or diagrams to illustrate mitotic cell reproduction. *Mitosis* is reproduction where a new cell is formed that is *exactly* like the parent cell. Introduce basic cell parts:

Nucleus: center of cell which contains genetic material.

Chromosome: organism in nucleus which contains genes.

Man has 46 chromosomes, 23 pairs. Find out how many chromosomes other plants and animals have. How many genes are on each chromosome?

In mitosis, the number of chromosomes doubles and splits into two groups within the nucleus, each of which are exactly like the original cell. Then the entire cell splits, leaving two identical cells where there was only one before. How does this happen? How are they exactly reproduced with the genes in the same order?

Introduce basic DNA structure (double helix). One need not memorize the names of the pairs of bases but should understand that when the double helix unwinds, free-floating bases within the nucleus attach themselves to each separate strand of the DNA molecule, thus reproducing the DNA in the same order as the original strands. The order of the bases determines the gene sequence.

Using overhead transparencies, introduce *meiosis,* or sexual cell reproduction. In meiosis, the cell divides without doubling of chromosomes. Instead, the chromosomal pairs divide, so that the new cells have only half the number of chromosomes of the parent cell. Because the chromosomal pairs divide, a genetic trait comes from both parents. For example, in flowers, the male part of the flower (pollen) fertilizes the female part (ovaries) and the number of chromosomes in the seed produced (1/2 + 1/2) is back to the original number in the parent cell.

Visual Aids

Two good filmstrips that illustrate both mitosis and meiosis are produced by Ward's Natural Science Establishment, Inc. They are part of a series entitled *The Living Cell*. Strip

5 is about Protein Synthesis and deals with DNA structure; Strip 6 is about Reproduction and deals with mitosis and meiosis. Vocabulary used on these strips is complex for upper elementary level, but the graphics present an excellent picture of cell reproduction and the DNA molecule.

The filmstrips also introduce the concept of mutation which can lead to a lively discussion of topics such as: aging, X-rays/radiation, chemicals/poisons. What happens to the pre-determined order of the base pairs if there is damage to the chromosome?

Topics for Further Discussion:

-*Genetic*, or *sex-linked* diseases: hemophilia, sickle-cell anemia, Tay-Sachs disease

-*Spontaneous mutations*: Albinism

-*Chromosomal disorders*: Down's syndrome

-*Breeding*: Using mutations or particular traits to breed a stronger plant or animal, or a plant/animal with a specific characteristic (long hair in dogs, plant resistance to disease).

Students should understand that genes not only determine what type of plant or animal will be born, but continue to operate through the life of the organism to determine growth patterns, time of maturity of the organism, etc. (i.e. height, brain and bone development, longevity). A pair of filmstrips entitled *"Why are you not an Elephant?"* adequately reinforce the concept of genetic endowment which continues throughout life. They are from The Wonder Series and are available at McCarthy Middle School.

Spin-offs:

The Aging Process: Why does hair turn grey? As a person or animal grows older, spontaneous mutations occur (white hair) and cell reproduction (mitosis) slows, making repairs of damaged tissue (broken bones) more difficult. Ninety-eight percent of all mutations areunfavorable.

Other Studies:

-Building of a DNA molecule using sticks and foam balls

-Study of plant and animal breeding/benefits to mankind

-Further study of the cell structure/introduction to microscopes

-Genetic disasters caused by pollution/drugs: The Love Canal, Thalidomide

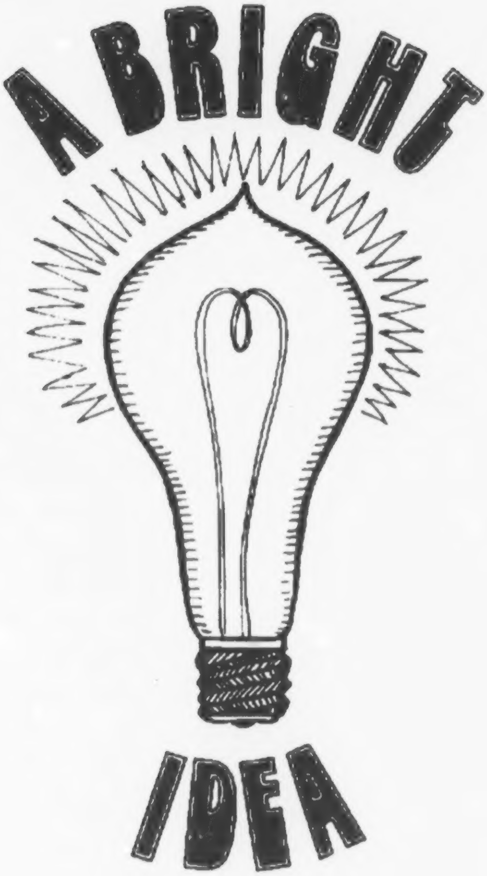
End Of Unit Test

To determine if students have understood the concepts and vocabulary, a sample post-test is included. Students should answer by writing sentences. Some children quickly understand Mendelian genetic crossing, while others need to repeat crosses of different types, to strengthen their understanding. Assign homework, use feltboard and go over all material carefully before post-test.

SAMPLE POST TEST

1. What is a gene? What is genetics?
2. In your own words, tell what a chromosome is. How many pairs of chromosomes do humans have in each body cell?
3. During mitosis, what type of cell reproduction takes place?
4. During meiosis, what type of cell division takes place?
5. Where is DNA found in the cell?
6. What does DNA do?
7. What is the shape of DNA?
8. Who was Gregor Mendel?
9. If a purebred, tall pea plant is crossed with a purebred, dwarf or short pea plant, what will the next generation of pea plants look like? (Tall is dominant)
10. Brown eyes are dominant in humans. Blue eyes are recessive. What possible combinations of genes can result from a blue-eyed mother (bb) and a brown-eyed father (Bb). What would be the appearance of the offspring, if one had a statistically reliable sample?
11. When purebred black-furred guinea pigs are mated with white-furred guinea pigs, all the offspring are black-furred. Why?

INVENTION CONVENTION


A BRIGHT
IDEA

PROJECT SAGE

OVERVIEW

Consider the following questions concerning your invention before making final application.

- ☐ Is your invention practical?
    - Can it be made easily?
    - Will it withstand use or will it break easily?
    - Is it as simple as possible?
    - Is it safe?
    - Will it cost too much to make or to use?
- ☐ Is your invention really new?
    - Are you aware of inventions similar to yours?
    - Will people really use your invention and will they buy it?
    - Survey people in your neighborhood to document this.

PROCEDURE FOR PROOF OF PRIORITY

As soon as you have an idea that meets the qualifications previously referred to, complete the Disclosure Form (page 4). Make sure it is dated, has your name on it and includes a picture and a description of your invention. Take it to the office for Notarization (date and stamp).

Place the Disclosure Form in an envelope. In the presence of the principal (or secretary), seal the envelope with wax. Then have it dated by the principal (or secretary). Put it in a safe place and do not open until Invention Convention is held on (date).

If you make improvements in your idea as you go along, make a new "Disclosure Form" in the same way as described above.

DISCLOSURE FORM

Your Name:

Date:

Title of Invention:

Drawing

DESCRIPTION

(Notarization)

by Main Office

PROCEDURE FOR "REQUEST FOR PATENT"

Fill out the request form. Answer all questions clearly and specifically. Include a drawing with this form. In the presence of the principal, sign the oath and have him "notarize" the document.

The principal then numbers the form and dates it.

For Office Use Only

Number:______

Date:

REQUEST FOR PATENT

I, ________, hereby request from the Commissioner of Patents, that a patent be granted for________________.

____

(Title of Invention)

1. General Description (be clear and specific).

    a. What does it do?

    b. How does it work?

    c. How is it made?

2. Claims

    a. Why is it new and original?

3. To the best of my knowledge, I________, am the original inventor of this

____. (Invention)

____

Notarization

IDEAS FOR INVENTIONS

The following is a list of items that might be simple to invent. Undoubtedly, inventors will be able to think of countless more items to invent.

1. A paper clip that cannot work loose and yet will not damage the paper surface when removed.
2. An improvement on the kinked hairpin.
3. An erasing key on a typewriter.
4. An air valve on auto tires that registers pressure at all times.
5. A bathroom soap dish that will remain dry at all times.
6. An automobile door-lock cover that cannot become frozen in place with sleet.
7. An alarm device for motorboats that will warn the boatman his craft is entering water that is too shallow.
8. A cheap method of binding books that will eliminate most or all hand operations.
9. A comb that will not accumulate hair and which has less tendency to pull hair out.
10. A simple attachment for the arch of a shoe that will positively prevent slipping on ice.
11. Scissors that will constantly sharpen themselves as they are used.
12. A new and better method of attaching hammerheads to handles.
13. A folding plastic camera tripod that is light enough to be carried in a coat pocket.
14. A sales machine for projecting samples of wallpaper on walls.
15. A check-protector writer, costing ten dollars or less, for personal use
16. An adjustable child's sled that can be made longer as the child grows up.

17. An all-plastic egg beater of simple design, easy to wash.

18. An ink drafting compass that will carry a non-plugging fountain pen the line of which can be adjusted in width.

19. An umbrella with plastic ribs that can be guaranteed against turning inside out.

20. A truly noiseless power lawn mower.

21. A typewriter with self-cleaning type or a device that can be attached to the typewriter to keep the type clean.

22. Some chemical means of treating wooden shingles so they will never shrink or warp.

23. Better ventilated and more comfortable goggles for welders and other workmen who have to wear the goggles.

24. A natural insecticid. In other words, how can we get rid of ants without using chemicals?

25. A solar powered tea maker.

26. An umbrella hat.

27. A collapsible bucket.

28. A window washer for second story windows.

29. A dripless pitcher.

30. A stamp and letter licker.

31. A device to help people quit smoking. This could alsobe a method to help people quit smoking. If you try this one , try your method on someone you know who smokes and report your findings.

32. A smokeless ash tray. If you cannot stop people from smoking, at least you can prevent their smoke from polluting your air space.

33. A non-tippable cup for adults.

34. An automatic dishwasher silverware rack. Design one which can be disconnected and placed in a drawer without your having to sort the silverware.

35 A bingo game for children who cannot read numbers or letters.

36. A frisbee for blind children.

The following items might be designed using recyclable materials:

37. A toy designed which uses left over milk cartons.

38. A piece of exercise equipment.

39. A shoe stretcher to keep boots and wet shoes in shape.

More Design Ideas:

40. Design a method using egg cartons to teach addition and subtraction or multiplication and division.

41. Design a universal license plate which would identify every citizen and the state from which they come. Provide as much information on the license plate as you can about the individual.

    Also, explain the technology necessary to adopt your idea.

42. Write a "Who's Who" in an Emergency book.

    Who would you call if a window breaks?

    What happens if your house is attacked by bees?

    Who would you call if a flying saucer landed on your lawn tomorrow?

    Suppose tree roots start growing in the middle of your house?

    Who is the person to call? Suppose you ran out of food? These are just some of the ideas to include in such a book.

43. A fool-proof method for keeping track of socks.

44. Write a book entitled *"How to be a Successful Child": Mistakes Children Make Most Often and How Children Can Avoid Making Those Mistakes.*

45. Write the "Homework" book.

46. Some kids seem to get their homework done every night and it is always all right. How do they do it? Some parents and children would love to know if there is a fool-proof method.

47. Ever wonder what lunches would be like if you could design the menu?

    For the cafeteria, design a menu which lists nutritious and inexpensive foods that kids like. (Now that's an invention!)

48. Write a guide for parents.

    Many adults write books for parents on how to be a better parent. Very few children have the chance to express their opinions. Design a fool-proof method for raising super children.

49. Outer Space

    What items will man need for exploration of our solar system?
    Invent an item which will be useful twenty years from now.

INVENTION CONVENTION

Judge ______________________________

Name of Invention ______________________________

Description ______________________________

____

	Rating Scale				
Documentation of Need	1	2	3	4	5
Creativity	1	2	3	4	5
Overall Quality	1	2	3	4	5

The Town of North Kingstown, R.I.

Whereas ____
presented to the Commisioner of Patents a petition for the grant of a Patent for a new and useful improvement in

____

a description of which invention has been submitted according to all requirements provided, and

Whereas upon proper examination the applicant has been judged to be entitled to a patent under the Law.

Now therefore a Patent is granted to

____

for the term of Seventeen years from the date of this grant with exclusive right to make and sell said invention.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed at the Town of North Kingstown this day of in the year.

Attest

______________________ ______________________

Priancipal Examiner Commisioner of Patents

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GO FLY A KITE

PROJECT SAGE

OVERVIEW

The science of kite-making is a fascinating experience for children. Not only is it fun, but it offers students the opportunity to investigate balance, concepts of aerodynamics, history, mythology, design, safety and world records.

The enclosed learning center activities provide students with an opportunity to explore, research, construct, record and design "flying-objects," primarily focusing on kite-making. Within the center, materials for kite construction should be available for students' use. Many materials may be collected by students themselves.

A mimeographed booklet should be distributed to students (masters enclosed). The starred activities should be mandatory. The student should then choose an additional activity to pursue independently. The culminating event of the kite-making center can be a kite-flying competition in which parents, members of the community and other interested students may participate. Gifted students should take charge of organizing the contest by enticing others to become involved, setting up competition rules, selecting judges and determining rewards to be given. Gifted students themselves will participate in the contest.

To further students' interests in flying-objects, each student will plan an independent study based upon a study of aerodynamics. Suggestions for possible independent study topics/activities (Independent Study Suggestions) are within this packet.

Students will share independent study projects with their classmates and other intended audiences.

OBJECTIVES

Student will:

- ☐ explore the art of kite-making: selecting materials, choosing design, building a kite.
- ☐ trace the history of kite-making and the uses (and purposes) of kites.
- ☐ compose letters to kite organizations (and people who contribute much time and effort to the sport of kite flying) to gather additional information about kites.
- ☐ become involved in scale drawings, measurement, geometric forms, ratio, area, weight factors, balance and principles of aerodynamics.
- ☐ Study the topic "Breaking Free."
- ☐ Make a kite, beginning with a proven design, and then create other designs.
- ☐ gather data for comparisons of various kites by constructing simple wind gauges and instruments that calculate altitude.

- ☐ document their successes and failures of kite-flying by keeping a log of their work and findings.
- ☐ elaborate on topics such as "Beyond the Clouds" and "Flight with a Flock of Seagulls."
- ☐ design books about kite-making, compiling information found during their study.

OPTIONAL PRE-ACTIVITIES FOR KITE-MAKING

1. For years, since it departed from legend to lore, the kite has been thought of as a trivial toy, a play thing. But history tells us that the kite is much more than a toy.

   -Benjamin Franklin
   -Leonardo da Vinci
   -Thomas Melville
   -Alexander Wilson
   -Sir Henry Cavendish
   -U.S. Weather Bureau
   -Joseph Montgolfier
   -James P. Epsy
   -Samuel Franklin Cody
   -Eugene Seder
   -William Eddy

   In fact, the kite has been found useful in many ways, one of which is meteorological work.

   Explore the efforts of one of the following men or organizations who have utilized the kite in their study of the atmosphere.

2. Keep a record of your kites and how they perform. Select a blank notebook or make a log booklet. For each kite you make, enter its name, rating, dates of flying, and flying ability. State its good and bad points, and how the latter were corrected. You will soon have a valuable handbook that will assist you in building almost any kind of kite desired.

3. Read the Greek myth about the flight of Icarus. Investigate the story's implication of the effort to fly a man-lifting kite.

4. Research the history of kite-making to discover ways kites have been used. The following places can be studied in regard to the history of kites.

   -China
   -Polynesian Peninsula
   -Ancient Europe
   -Malayan Peninsula
   -Ancient Egypt

5. Study the aerodynamics of kite flying. Learn how "lift" and "drag" help kites to fly.

6. Learn how to make and fly some dazzling kites. For your first kite, select a pattern for a kite that you would like to construct. Compile a list of kite-building materials

needed. Meet with your teacher to review your order form and collect materials after your list has been approved.

Begin constructing your kite, following directions carefully and observing the shape of design, the weight factor and laws of aerodynamics.

Construct a kite of your own! Select another pattern for kite-making and modify the design. Proceed as you did in making your first kite.

7. After you have made your kites, compare your kites with your friend's kites. You might find that you need to construct instruments for calculating altitude or wind identification. Try making some simple wind gauges and other instruments as needed.

   -Make a Clinograph - altitude
   -Use the Range Chart - altitude
   -Use the Beaufort Scale - wind identification

8. During your experiences of kite-flying, you may develop certain feelings and ideas about freedom and breaking free.

   What is freedom?

   To what extent are we free?

   Are ones ideas free like a soaring kite?

   Write stories or poems about your feelings. Possible topics are:

   -Beyond the Clouds
   -Flight with a Flock of Seagulls
   -Choose a topic of your own!

9. Design books about kit making, compiling information found during your study.

10. Research the topic: "Old Uses of Kites."

11. Create an unusual artistic design for your kite. Make a design that looks like the person who will be flying it.

12. Choose a name located on the correspondence list in the center. Most of the people listed will correspond with other kite fliers, answer questions, and if in your neighborhood, even come out and flykites with you. Get in touch; they'd love to hear from you!

13. Browse through the *Guinness Book of World Records*. Observe the types of world records for kites.

14. Investigate the safety rules that should be followed when flying kites. Post these rules in our center and at home.

ACTIVITY CARDS

On each card, copy the corresponding activity and give one card to each student, or to a group of students, hand out several cards that contain activities.

Card 1 Draw a flying thing of the future.

Card 2 Make a time line of aviation history.

Card 3 On a picture of an airplane, label all of the essential parts—nose, rudder, aileron, elevator, vertical stabilizers, horizontal stabilizers, and main wing. Describe the purpose of each part.

Card 4 Make a list of all the things you can think of that fly. Divide your list into "living" and "non-living" things.

Card 5 Make a paper airplane. Fly it. Put a paper clip on the nose. Fly it again. What difference do you notice? Then move the paper clip back so that it is on the fold near the center of the plane. Observe what happens now. Try this with several different designs of paper airplanes. Can you explain what makes this happen?

Card 6 Make several different types of paper airplanes. Label the essential parts on each plane: the nose, rudder, aileron, elevator, vertical stabilizers, horizontal stabilizers and main wing.

Card 7 Make two kites that are exactly alike, except that one has a tail and one does not. Fly both of them. What difference do you notice? Make a hypothesis that explains why this happens.

Card 8 Make several box kites and cover different amounts of surface area on each kite. What effect does the surface area have on flying?

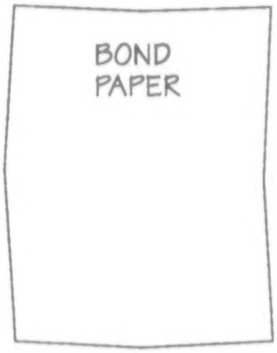
Card 9 Make several different designs of paper airplanes. Which design works best?

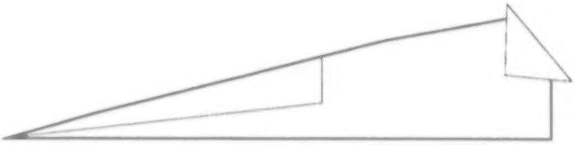
Card 10 Make your own design for an airplane. Make it different from any plane you have previously made. Fly it. Keep working on its design until you have perfected it.

Card 11	Make a book which explains the basics of kite construction and explains how to fly a kite. Give it to someone you think would enjoy it.
Card 12	Historically, kites have been utilized in more ways than as just a toy. Trace the history of kites. List some of the uses that have been made of kites.
Card 13	Study a drawing of Leonardo da Vinci's "flying machine." Find examples of other men's attempts at making flying machines. Make a collection of drawings or diagrams of these machines.
Card 14	"If I could fly I would . . ." Write a poem or story.
Card 15	Collect several specimens of insects that fly. Carefully study their flying apparatus.
Card 16	Write to an airplane manufacturer. Ask the manufacture at least three questions about airplane construction.
Card 17	How has flying changed man's life.
Card 18	Make a boomerang.
Card 19	Make a new game to be played with a frisbee, boomerang or a paper airplane.
Card 20	Design and make your own hot-air balloon.
Card 21	Research the development of the *parafoil*. Draw a diagram of a parafoil. What might be some possible uses for this new type of flying thing?
Card 22	Find the relationship between a glider's, flight and the position of its stabilizers. Bend them up, down, or one, level, and, one up. Note the effects. Do the same experiment to find the relationship between the position of the rudder, elevators or ailerons and the flight of the glider.
Card 23	Find out what the following terms mean: *lift, thrust, drag, gravity*. Explain the definition of these terms to a friend.
Card 24	Make an exhibit of airplanes which shows how wing-spread has decreased as power has increased. When you present your exhibit, explain the reasons for the airplane's decreased wing-spread and increased power.
Card 25	Make a collection of seeds which fly by means of natural parachutes or propeller blades.
Card 26	Make a diagram of a helicopter. Label its parts. Explain how it works. Make a simple model which will show the principle of helicopter flight.

TIPS FOR MAKING PAPER AIRPLANES

Tip 1	Airplanes need a large horizontal surface and a vertical part to keep them from slipping sideways. The vertical part may be on the top or the bottom or even on the wings.
Tip 2	The front of the plane should weigh the most.
Tip 3	If the airplane tends to nose down, make a small flap on the back part of the wing or tail and bend it up slightly.
Tip 4	To make the plane turn, cut a flap on a vertical part and bend it.





Name: ______________________________

TIME TO VOTE

Which flying object would you nominate for

the most beautiful: ______________________________

the most bothersome: ______________________________

the most powerful: ______________________________

the most useful: ______________________________

the fastest: ______________________________

the smallest: ______________________________

the most graceful: ______________________________

the most deadly: ______________________________

the most destructive: ______________________________

the most fun: ______________________________

the largest: ______________________________

the cheapest: ______________________________

MAKING PAPER

PROJECT SAGE

OVERVIEW

By allowing the student to explore the process and materials of making paper, this unit sets up conditions of freedom that facilitate spontaneous expression. In supplying students with these tools, the students can expand their capacity for responding in a variety of ways through experimentation.

OBJECTIVES

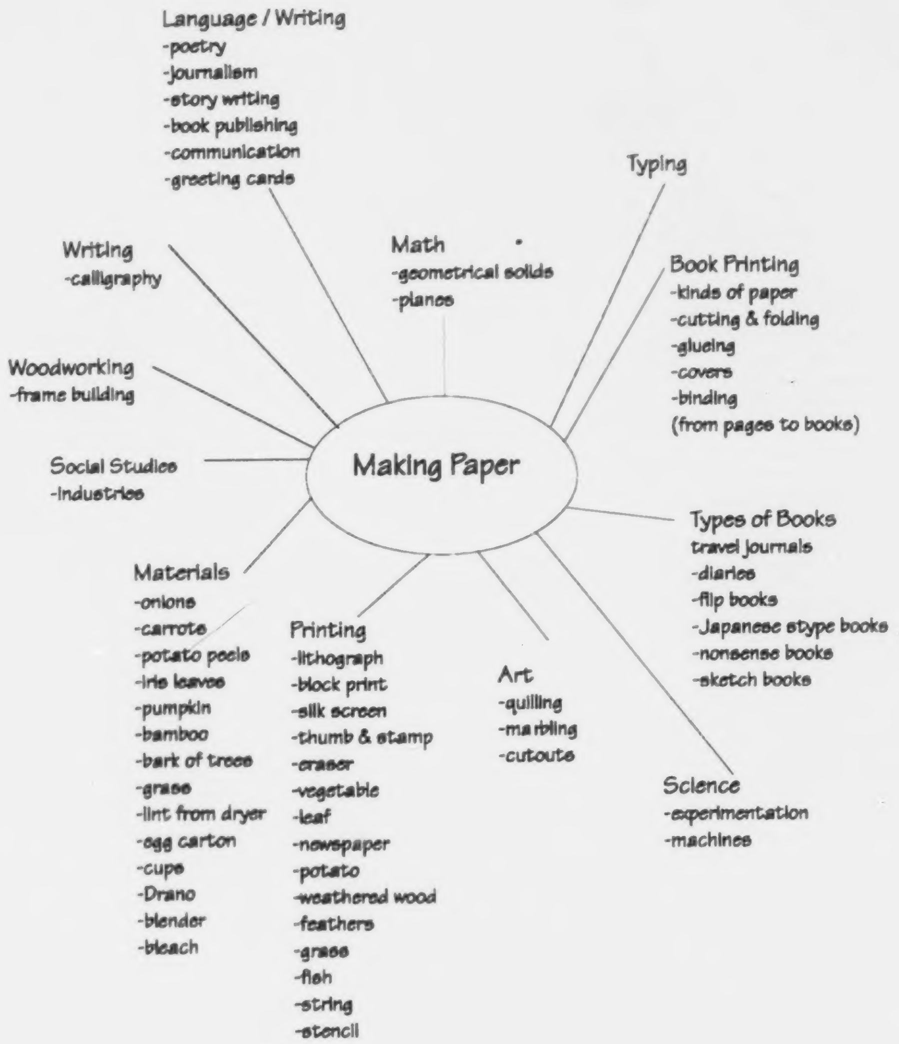
This unit presents an interdisciplinary approach to making paper. The students will experiment with a variety of materials which could be used for the making of paper. The finished product (paper) will then present a problem to students: What can they do with their newly created paper?

PROCEDURE

Students will set up a development center that will offer various experiences in printing, art, book making, social studies, writing, language arts, woodworking, math, typing and science. (See curriculum webbing chart).

ACTIVITY PROCEDURES

1. Gather materials such as lawn grass, onion skins, celery, old sock, egg cartons, pumpkin, leaves, etc.
2. Cut the material into very small pieces. You'll need at least 4-6 cups. Place the cut materials into a glass bowl and fill it with boiling water.
3. Slowly add 5-6 teaspoons of Drano or something with caustic soda in it. Cover the bowl and set it aside for 24 hours.
4. Drain off the Drano-water and rinse the material which is now starting to "break down." Put the materials in a blender and blend them with one part bleach and three parts water. Blend until smooth and free of lumps. You have now made pulp.
5. To make slurry, take one cup of pulp and add it to one gallon of water. Place the slurry in a large basin.
6. Make a screen using a wood frame covered tightly with a porous material.
7. Stir the slurry to separate the fiber particles. Dip the screen into the slurry.
8. Lift the screen catching a film of fibers onto the screen's surface. With practice you'll learn to make a smooth film.
9. Drain the film and then blot it onto white felt. You now have made *new paper*.
10. Remove the new paper from the screen and let it dry. Finish the rawpaper andcoat it with a mixture of one part white glue and four parts water.



Making Paper

Language / Writing
- -poetry
- -journalism
- -story writing
- -book publishing
- -communication
- -greeting cards

Typing

Writing
- -calligraphy

Math
- -geometrical solids
- -planes

Book Printing
- -kinds of paper
- -cutting & folding
- -glueing
- -covers
- -binding
- (from pages to books)

Woodworking
- -frame building

Social Studies
- -industries

Types of Books
- travel journals
- -diaries
- -flip books
- -Japanese stype books
- -nonsense books
- -sketch books

Materials
- -onions
- -carrots
- -potato peels
- -iris leaves
- -pumpkin
- -bamboo
- -bark of trees
- -grass
- -lint from dryer
- -egg carton
- -cups
- -Drano
- -blender
- -bleach

Printing
- -lithograph
- -block print
- -silk screen
- -thumb & stamp
- -eraser
- -vegetable
- -leaf
- -newspaper
- -potato
- -weathered wood
- -feathers
- -grass
- -fish
- -string
- -stencil

Art
- -quilling
- -marbling
- -cutouts

Science
- -experimentation
- -machines

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RESOURCES

Berger, M. (1978). *Printing Plant*. New York: Franklin Watts.

Johnson, P. (1975). *Creatinq With Paper*. Washington: University of Washington Press.

Weiss, H.(1974). *How to Make Your Own Books*. New York: Thomas Y. Crowell Company.

Welss, P.(1976). *Simple Printmaking*. New York: Lothrop, Lee and Shepard Company.

MAP-MAKING & CARTOGRAPHY

PROJECT SAGE

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OVERVIEW

Map-reading can be informative. Map-interpreting can be stimulating. Map-making can be challenging. In the hands of a well-informed person, maps can reveal countless stories of man, nature and the relationships between them. Maps can give second eyes for understanding the location and arrangement of things, for grasping all the essential traits of a region and for serving as a source of ideas relative to the social, political and economic effects of the distribution of phenomena.

This unit presents a creative focus to the study of maps. As students become cartographers by creating an island, country or state, they will apply map-reading and map-interpretation skills. Knowledge of pictorial symbols, semi-pictorial symbols and non-pictorial symbols will assist students in the origination of physical maps, population maps, product maps, land elevation maps, vegetation maps and more!

Some generalizations concerning map-making are:

1. Maps are an essential tool which man utilizes to represent his environment.
2. Maps are different, depending upon their purpose.
3. Man uses maps in order to conceptualize direction.
4. Man uses map symbols in order to convey information.
5. Map scales are comparative in order to measure distance accurately.
6. Man has created political boundaries, separating countries and states.
7. Man has created geographical boundaries to separate time and climate zones.
8. Man has developed intercepting lines of latitude and longitude to locate places.
9. Maps measure altitude of land formation.
10. Maps measure land form below sea level.
11. Land location affects man's lifestyle.

OBJECTIVES

The following are the objectives for the students in this unit.

- ☐ By studying maps, students will relate themselves to the universal and immediate environment.
- ☐ Children will observe and associate that there are different maps for different purposes: physical maps and political maps.
- ☐ Through the development of individual activities and projects, the student will learn to review the various aspects of maps in order to think critically and creatively.
- ☐ Students will identify symbols, creating legends/keys.

☐ The student will develop the ability to discriminate between longitude and latitude and utilize this information to locate land on specific coordinates.

☐ The student will construct a series of maps to depict a chosen land that he or she wishes to create through the use of materials including plaster, oak tag, colored pencils, markers, paints, etc.

☐ Students will determine the size of their land and illustrate their map using an appropriate scale of miles.

☐ Through outside reading, from the classroom and library, the student will acquire an interest and spirit of inquiry about maps.

☐ Students will develop the concept of direction by defining cardinal directions on student-created maps.

☐ Students will distinguish between pictorial symbols, resembling the actual features, such as houses, schools, churches, places of interest; semi-pictorial symbols, resembling the landscape features for which they stand, such as a wavy line for a river, a curving and irregular line for a coastline, an outline of a lake; and non-pictorial symbols having no resemblance to the landscape features, such as color layers which represent altitude, or, perhaps, inches of rainfall or degrees of temperature, dots or shadings which represent population and show distribution, or broken lines to represent a caravan.

ACTIVITIES

Creating a Land

Have students imagine an island, country or state where they would like to live. The land may be an existing landform or purely mythical in nature. In written form, students should expand upon the following information about their land:

-the name

-climate

-type of land

-type of people

- land forms, such as mountains, rivers, lakes and canyons, etc.

-what type of place is it?

-the location

-population

-famous places

-history of land how old is it?

-roads

After students have outlined and researched facts concerning their land, they may begin applying map skill knowledge in constructing their own maps.

Map Scales: The Size of Your Land

Maps and globes can help us to find the distance between two places. We know that we would need a very large map in order to show a distance as it really is on earth. For example, we would need a map more than a mile wide to show a real mile. Thus, the map-maker reduces the size of his map. The map-maker uses a measure to show the relation between the map and the real area on earth. We might say that one inch on the map stands for, or is equal to, one mile on the earth. Then, two inches on the map would be the equivalent of two miles on earth. This measure or manner of showing distance is called the map scale.

There are several ways of showing the map scale. One inch can be equal to one, five or even one hundred miles. The map-maker must determine the appropriate scale. The scale will depend upon the size of the area to be mapped.

As map-makers, students should determine the size of their land to be mapped. Based upon this information, students then select an appropriate map scale before drawing their map outline.

Using a map of the world, have students draw or identify their land in relation to the closest continent. Students' drawings must take the stated map scale into consideration.

Adding Cities

People in airplanes can see certain features on earth as they fly above the earth. When the airplane is not very high over a city, the flier can see buildings and streets. As the airplane flies higher, the flier is able to recognize fewer things. Finally, the city may look just like a dot on the earth.

The map-maker shows cities on a map by drawing dots. This shows large cities and small cities. Dots of different sizes show different sizes of cities. To know how large a city is, look at the map key. Each map-maker may decide on the size of the dots on his or her map. The dots are not always the same on every map. This key shows how one map-maker uses dots for cities:

Cities having 1,000,000 people

Cities having 300,000-1,000,000 people

Cities with 100,000-300,000 people

Cities with less than 100,000 people

What are the major cities of the students' lands? Students should create a map of their land, indicating cities.

Creating Populations

Some maps tell us how many people live within a country or state. A dot is often used as the symbol to stand for a certain number of people. For example, one dot may stand for 100 people. If there are five dots, there would be 500 people. Colors may also be used to show the number of people within an area. Such maps are called *population* maps. *Population* refers to the number of people.

One important thing about the population of an area is the *distribution*. *Distribution* refers to whether the people live close together within a small area or whether they are scattered over the area. When many people live close together, we say that the population is *dense*. When there are few people scattered over an area, the population is *sparse*.

Rhode Island is a small state with many people. It has a dense population. Wyoming is a large state. There are few people and they are scattered over the state. It is sparsely populated.

Students should construct a population map of their land, noting areas that are densely and sparsely populated.

Using Elevations

A physical map shows the landforms of the area that is mapped. Many map-makers in all countries use certain colors to show different land elevations on physical maps. The same, or nearly the same, colors and shades of the colors are used to show these elevations. By using the same colors, we become accustomed to reading physical maps. This color scheme is called the "International Map Color Scheme" because all nations use it.

Light green is used for elevations from sea level up to 500 feet. These are lowlands. Yellow-green is used to show higher elevations from 500 feet to 1,000 feet above sea level. Yellow is used to show higher lands from 1,000 feet to 2,000 feet. Light tan or light brown shows land from 2,000 feet to 5,000 feet. Such land elevations are often high plateaus. Still higher elevations from 5,000 feet to 10,000 feet are colored dark brown. These areas are mountain lands. Very high mountain peaks over 10,000 feet are colored dark red. A few map-makers use white to show high mountains.

Blue is always used to show water. The depths of water are shown by shades of blue. Light blue shows shallow water. Darker blues are used to show ocean depths.

Have students design a land elevation map, depicting landforms of their land area. A relief map is very exciting for students to construct. Using posterboard as a base and paris craft to build up landforms, students can actually create the terrain of the land: sea levels, plateaus, lowlands, mountains, etc.

Charting Rainfall Maps

When we study a country, we want to know about its climate. Knowing about the climate helps us, in part, to tell what the people do in that country. We may be able to tell whether the people are farmers, lumbermen, or some other type of workers.

There are two very important things to know about climate. One of these is temperature. We need to know whether it is always hot or always cold or whether there are seasons. We also need to know about the amount of rainfall.

Rainfall is measured in inches. The weather department keeps a record of the number of inches of rain that falls each year in a particular place. Such a record is kept every year. These records are averaged. The average amount is given as the rainfall for the area.

The average rainfall can be shown on a map with a symbol. We must study the map key to understand how much rain a place gets. Map-makers use different kinds of symbols to show rainfall. Some use colors. Some write the amount on the map.

The time of the year when rainfall occurs is also important. If most of the rain occurs during one season, the rest of the year may be very dry. If most rain occurs in the summer when it is warm, crops may be grown. If most of the rain occurs in the winter, the summers may be too dry for farming without irrigation. In many places, rainfall occurs every month of the year. In other places, there is little or no rain at all. Such a place is a desert.

Some books use two rainfall maps to give the rainfall for an area. One map shows the amount of rain from January to July. The other map may show the rainfall from July to January.

Have students create a rainfall and/or weather map, showing the climate of their land. Students should make certain the climate of their land correlates with the main products of the land (e.g., farming cannot be a primary focus if the level of rainfall is not abundant).

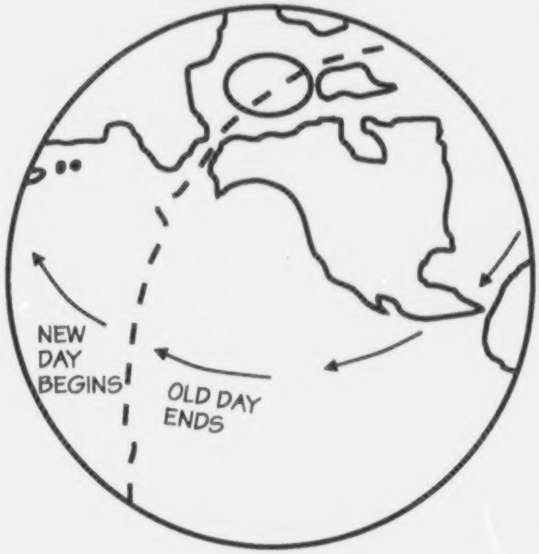
The International Date Line

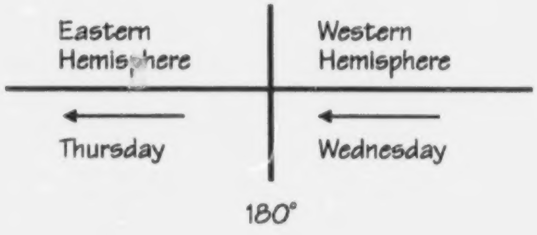
If we were to travel completely around the world, following a parallel of latitude, we would lose or gain a day. A trip made completely around the world is the same as one complete rotation of the earth.

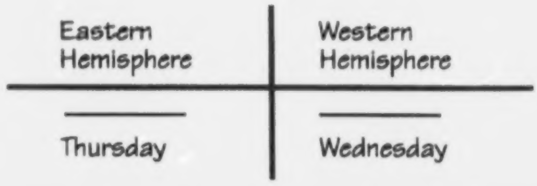
In the Pacific Ocean is the 180th meridian. This is half-way around the earth from Greenwich or the prime meridian. 180 degrees divided by 15 degrees gives exactly 12 degrees. We remember that the earth rotates 15 degrees in one hour. So, at 180 degrees, we are 12 hours away from Greenwich.

When it is noon Monday at the prime meridian or Greenwich, it is 12 hours later at the 180th meridian. This would be the midnight between Monday and Tuesday. Monday has ended at the 180th meridian and Tuesday begins.

For this reason then, at the 180th meridian a change must be made in the calendar. The old day ends at this meridian and a new one begins. This





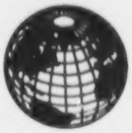


meridian where the change takes place is the "International Date line."

If we travel west across the International Date Line, we add a day. If we travel east across the International Date Line, we subtract a day. If we were to travel from California to Asia, we add a day as we cross the Date Line. When we return from Asia to California, we subtract a day.

When we look at the International Date Line on a map, we notice that it does not follow the 180th meridian at every point. It jogs around some islands in the Pacific Ocean. This is done to avoid having two different days within some island groups.

> *Have students identify how the International Date Line affects their land. Where does their land fall in relation to the Date Line?*



Other Kinds Of Maps

You have learned a great deal about maps. You know that maps can tell us many things about the earth. We remember that in order to read maps, we must look at the map key. Then we are better able to understand the map.

There are many other kinds of maps. One kind is a map that shows the native vegetation in a region or country. On this kind of map, the map-maker shows what kinds of trees, grasses or other plants grow naturally in the area. Such a map shows what plants were growing before men came into the area and began to plant crops or to build houses. To show the vegetation, the map-maker may draw figures to represent trees or, grasses or, other types of vegetation that grows in certain places. We call this kind of map a *vegetation* map.

When we study a vegetation map, we should study it along with a soil map. This map shows the kinds of soil found in the area. Though, a temperature, rainfall and physical map would help us to understand the vegetation better. Then we would know more about the region. This is true because all of these factors, temperature, rainfall, soil and landform are important in order to determine what will grow.

Another kind of map is a *pictorial* map. This is a map on which pictures are drawn to stand for the kind of things to be shown. For example, if pictures of trees and grass are drawn on a vegetation map, this map is also a pictorial map. Sometimes, the products produced in a region are shown by pictures. A picture of an ear of corn may show where corn is grown. This kind of map is a product map. It is also a pictorial map.

Weather maps are found in our newspapers almost every day. They help us to know what kind of weather to expect.

People who study history also use maps. We can show the travels of discoverers, places that were discovered and many other facts.

We can show on a map almost anything we need to know about the earth. When we really understand how to read maps, we can learn a great deal.

What other types of maps will students need to show the social, political and economic effects of their land?

Have students create any additional maps needed to present the environment of their land.

RESOURCES

Aschemeyer, E. (1979). *Maps Unfold the World*. St. Louis, MO: Milliken.

Brown, L. A. (1960). *Map-making: Art that became a science*. Boston, MA: Little Brown & Co.

Estep, I. (1962). *Good Times With Maps*. Chicago, IL: Melmont.

Epstein, S., Epstein, S. (1959). *The First Book of Maps and Globes*. New York: Franklin Watts & Co.

Hackler, __. (1968). *How Maps and Globes Help Us*. Benefic Press.

Hanson, F. M. (1967). *Map drawing: Map symbols and geographical terms*. New York: McGraw Hill.

Hathaway, J. A. (1966). *The Story of Maps and Map Making*. New York: Golden Press.

Moor, P., Brinton, H. (1967). *Exploring Maps*. New York: Hawthorne.

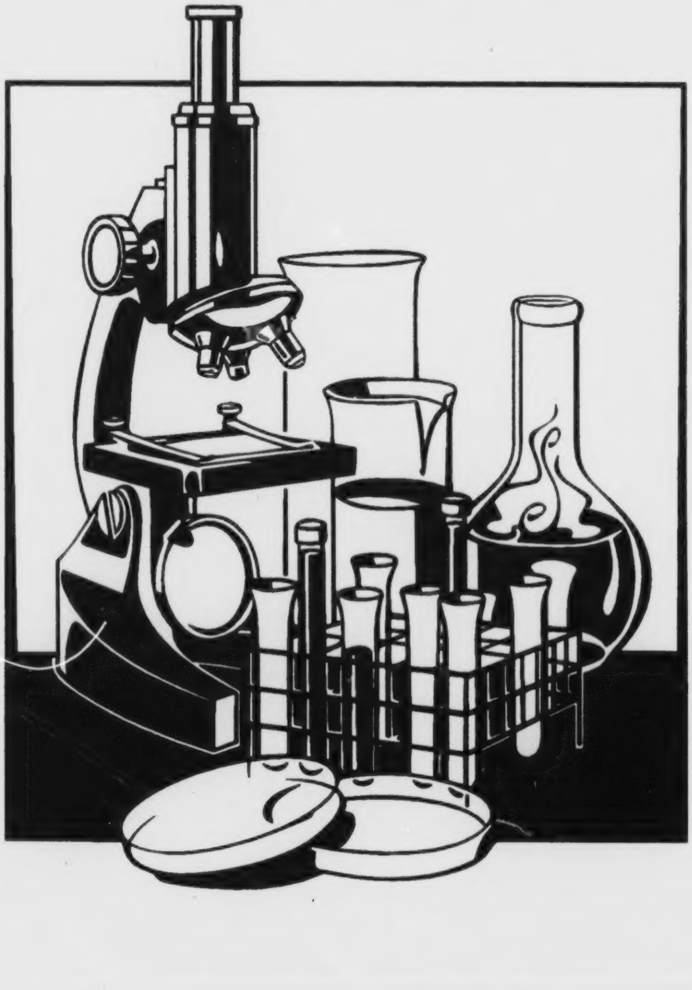
Oliver, J. E. (1970). *What We Find When We Look at Maps*. New York: McGraw Hill & Co.

Rhodes, D. (______). *How to Read a City Map*. Elk Grove Press.

Rinkoff, B., Galster, R. (1962). *A Map is a Picture*. New York: Thomas Y. Crowell.

Watts, F. (1968). *First Book Atlas*. Hammond & Co.

MICROSCOPES: *Passport to Fun*



PROJECT SAGE

OVERVIEW

In this unit, students are introduced to the microscope, which provides opportunities for them to explore some unseen aspects of their environment. The microscope extends the sense of sight andhelps students develop an awareness of the form and appearance of various living and nonliving things not visible to the naked eye.

Initially, students should focus on the function and properties of lenses. They should observe things with a water-drop lens and a hand held lens before investigating a simple microscope. After students have examined the microscope and established the function of each of its parts, they should learn to construct and stain their own slides. Observational and recording skills are developed as students describe specimens viewed through the microscope.

In addition to the activities presented in this unit, it is suggested that teachers purchase the teacher's guide for *Small Things—An Introduction to the Microscopic World, an ELEMENTARY SCIENCE STUDY (ESS)* published by Webster Division, McGraw - Hill Book Company. ESS is an integral part of this unit providing excellent background information for the study of the microscope. Worksheets for group and individual investigations are provided. The *Small Things* unit encourages students to ask questions, and use their minds and hands to find answers to their questions. As they observe, compare and generalize during explorations of living and nonliving matter through the use of magnification processes, they will find answers to their questions.

OBJECTIVES

During this unit students will:

- ☐ learn to use and care for a microscope.
- ☐ become conversant with the terms related to the microscope.
- ☐ prepare slides of living and nonliving material.
- ☐ describe characteristic properties of specimens observed under a microscope.
- ☐ examine a variety of specimens to determine the existence of a cellular structure.
- ☐ gather information about scientists associated with early discoveries related to the microscope.
- ☐ establish that a microscope does not physically increase the size of the object being viewed.
- ☐ make accurate observations and record them in an organized format.

WHAT IS A CELL?

Facts to Discover:

- The cell is the smallest unit of life capable of existing independently.
- The cell consists of many parts.
- Each part functions in a special way.
- There are many types of cells.
- All living things are made of cells.

Materials Needed:

-onion
-water
-glass slide
-glass cover slip
-toothpick
-eye dropper
-small paper cup
-iodine, ink or methylene blue stain
-knife
-microscope

Discussion Questions:

How does a rock differ from a plant?

What do you think living things are made of?

How would you find out?

What will children do?

WHAT IS A CELL?

Step 1 Obtain an onion and a knife. Cut the onion in half.

What do you notice about its structure?

Step 2 Obtain an eye dropper, a cup of water, a glass slide, iodine, and a glass cover slip. Peel off an inside ring of the onion. From this ring, pull off the outer layer of tissue. This layer should be as thin as tissue paper. Place this tissue in a drop of water on a glass slide.

What do you think will happen if you place a drop of iodine on the tissue?

Step 3 Place a drop of iodine on the tissue.

What effect does iodine have on the tissue?

How will this help you see the tissue?

Step 4 Observe the tissue through the microscope. Record your observations. The small things you see are called cells.

How are these cells arranged?

ACTIVITY CARDS

On each card, copy the corresponding activity and give one card to each student, or to a group of students, hand out several cards that contain activities, or use your own imagination to decide how to use the cards.

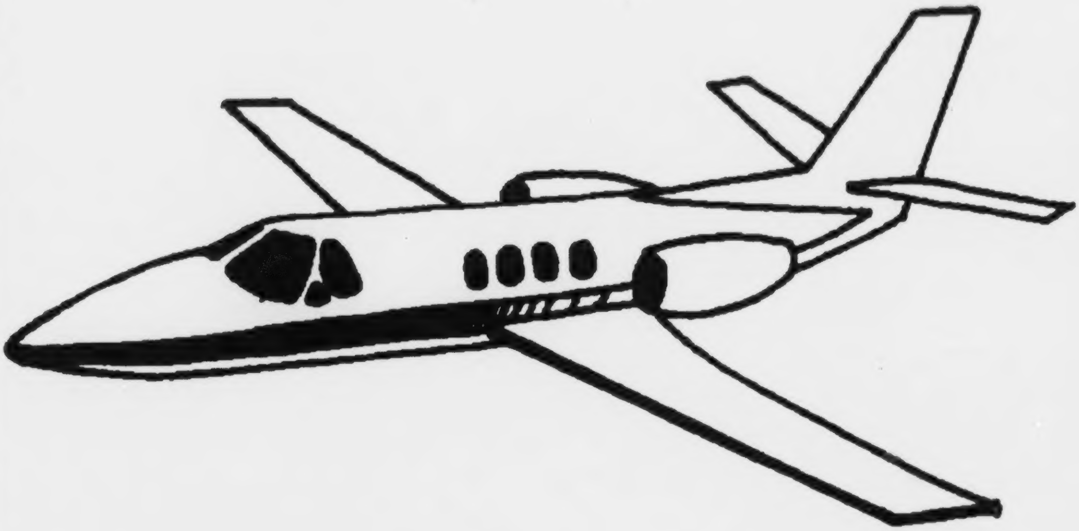
Card 1	Make a twenty-card picture file of non-living materials examined under a microscope.
Card 2	Examine any newspaper photograph. Contact a local newspaper. Request a guest speaker to come and talk about how photographs are printed.
Card 3	Make a series of jigsaw puzzles that classify different crystals and examples of materials which are representative.
Card 4	Analyze four samples of dust taken from four different locations. Make a chart of your findings.
Card 5	Compare salt with sugar crystals. Make a chart to illustrate similarities and differences.
Card 6	Examine cotton fibers and synthetic fibers under a microscope. Write letters to a variety of manufacturers requesting their scientific information about fiber strength. Decide which is more suitable for blue jeans.
Card 7	Make a dry mount of an individual letter from a newspaper article. Make drawings of your observations under low and high power.
Card 8	Stain fish scales with eosine-y. Compare unstained scales with those you have stained. Make large scale drawings and point out the differences.
Card 9	Use the following dyes: iodine solution, eosine-y, methylene blue, and methylcellulose, stained onion skin, sugar, cheek cells and leaf cells. Evaluate the effectiveness of each stain on each substance. Make a chart.
Card 10	Place a drop of pond or ditch water on a slide. (Do not cover). Observe. Make a list of adjectives to describe what you see.
Card 11	Make drawings of the animals in a drop of pond water. Make a chart which shows examples and their identifications.

Card 12	Grow your own microscopic animal farm. Put dry grass in a container with water; cap it and punch holes in the lid. Leave it for 3-4 days in a semi-dark area. With an eye-dropper make a wet slide. Write up the procedure and results as a scientific experiment.
Card 13	Analyze the way a paramecium feeds. Make a flip book.
Card 14	Compare samples of ditch, pond and tap water. Keep accurate records of the microscopic life in each sample. Put the records in a scrapbook with captions to identify them.
Card 15	Decide of what value each of the following is: amoeba, paramecium, euglena, volvox, rotifer, vorticella, euploidies, and chilomonas.
Card 16	Make a collection with a narrative.
Card 17	Cut the thinnest slice possible from a carrot (x-section). Prepare a wet slide with a cover slip. Make a drawing of the entire x-section.
Card 18	Stand a stalk of celery in a glass of water and red food coloring. Make a wet slide of a *x*-section of the celery stalk. Observe the cells, especially the red ones. Research xylem and phloem. Write an illustrated paper.
Card 19	Collect a variety of pollen grains. Keep them in a labelled plastic bags. Dry mount each variety on a separate slide. Make a drawing of at least five.
Card 20	Analyze the root hairs from a grass plant. Make three drawings: naked eye, low power and high power. Write a report about how roots absorb water and minerals. Display.
Card 21	Compare the cells of an onions' green top and those of an elodea. Draw pictures of each plant and a cell from each. Make a display.
Card 22	Give an oral presentation on the function of stomata in green leaves using a variety of media (drawings, slides, diagrams, pictures).
Card 23	Stain cheek cells with methylene blue. Observe and draw what you see.
Card 24	Prick your finger and draw a small amount of blood. Place the specimen on a slide and cover with a cover slip. Make a detailed illustration of what you see.
Card 25	Collect several examples of human cells (cheek, blood, hair, fingernails, saliva, skin). Observe each under the microscope. Make a chart.
Card 26	Analyze a strand of your hair under the microscope. How is it similar or different from a sample of someone else's hair ? Make a diagram.

Card 27 Take a saliva sample and prepare a slide. Take a second saliva sample and stain this sample with methylene blue. Compare the samples and diagram them.

Card 28 Construct a game which interprets various stains (eosine-y methylene blue, iodine, methylcellulose) and the various cells you have observed.

PAPER AIRPLANES



PROJECT SAGE

OVERVIEW

A piece of aerodynamically folded paper was navigated by a phantom pilot. Not long ago it was a sheet of notepaper, but now it glides like the fairest of white birds. A perfect flight requires very often an infinity of patience, a folding and refolding, a shaping and reshaping. In its final form, the paper airplane is a work of art!

The variety of airplanes is almost endless. There are monoplanes, biplanes, planes like beetles and planes like birds. There are planes that fly swift and straight, and there are planes that fly slowly in circles. Yet the planes with the most unique designs are those created by students.

OBJECTIVES

This unit focuses upon paper airplanes. It is designed to stimulate creative, open-ended activities, while encouraging investigations in areas such as history, math, science and art.

- ☐ Students will explore the art of paper airplane construction.
- ☐ While partaking in the artistic design of kite-making, children will become involved in measurement, geometric forms, ratio, area, weight factor, balance and principles of aerodynamics.
- ☐ Students will gather data for comparisons of various paper airplanes by designing charts and graphs.
- ☐ Students will document their successes and failures of paper airplane flight by keeping a log of their work and findings.

PROCEDURE

As students design paper airplanes, they become involved in problem-solving, determining cause and effect relationships and observing geometric characteristics. Their curiosities about scientific concepts may bring to fruition: the main forces of flight, air resistance, streamlining and friction, center of gravity and stability, equal and opposite action and reaction. *Paper Airplanes* allows students to develop and satisfy new curiosities through the creation of airplane designs and experimentation of flight. The Great International Airplane Competition, conducted by *Scientific American*, was the first of its kind, drawing interest far and wide. A paper airplane competition for your students would bring theory and practice together, promoting challenge and competition among students.

PRE-ACTIVITIES

1. To introduce your students to plane mania, seize any opportunity to launch suddenly and mysteriously a paper glider in your classroom. Arrange for the aerial wonder to arrive from the outside, through your window or from your corridor. As it zooms over the kids' heads, let them note this sporting *invitation,* boldly written on the plane: "Mine Flies Best. Bet You Can't Beat It." Then take advantage of children's love of "I Dare You" challenges and "Bet You Can't" contests and games by sponsoring a long-distance paper airplane flight contest.

2. Designate a hangar area for plane design and construction and a pilots' lounge for discussion. Set up a runway complete with a starting line and one-foot distances measured off and marked with masking tape strips.
3. Naming your airport adds spirit. Discuss with students all possible names and have students vote on the most favorable idea. Also, have pilots label their planes with identifying *insignia* or colors.

THE FIRST CONTEST

At the designated time for the contest fly-offs, have pilots line up five abreast. Give the signal to start and then duck for cover. After all planes have landed, observe and discuss the design features of the planes that traveled the least and greatest distances and, how they were launched. In this way the children are able to infer what constitutes a more successful design.

Let the pilots know that soon they will be in the air again. But first, they must put their planes to rest in the hangar area and then attend a brief meeting on airplane-design strategy. Assemble in the pilots lounge, where the discussion can center on identifying the variables involved and their effects on the airplane's flight.

The variables they are likely to offer are:

-plane weight , shape, size;

-wind direction or drafts;

-throwing technique or thrust given the plane.

List all their ideas on the chalkboard.

Briefly discuss how each variable might affect a plane's flight.

THE SECOND CONTEST

A second *Long-Distance Paper Airplane Flight Contest* would allow the children to utilize their knowledge of successful designs and variables.

Ask:

How would you change your airplane's design?

How would you throw it for take-off?

Allow a few minutes for making changes. Run the second contest. Recognize first, second and third place winners. Then discuss results and observations.

Is the plane that flew the longest distance necessarily the best plane? (Children may have all ready suggested that theirs are better planes in different respects.) What criteria can be used to find different "best planes"? These student-suggested criteria can be used to form the contest divisions for a Sage competition.

"PLANE" GEOMETRY

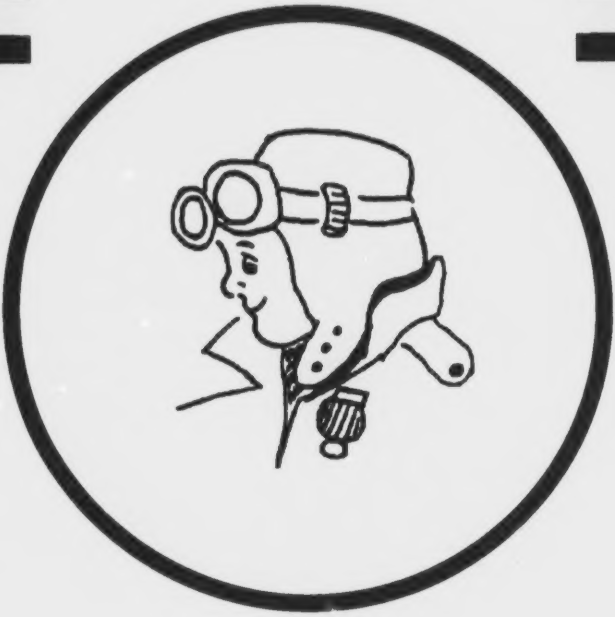
Paper airplanes provide numerous opportunities to introduce basic and important mathematical concepts.

Have the children unfold their paper airplanes. Let them observe the characteristics of the airplanes, and when possible, identify the geometric shapes defined by the folds in the paper. The youngest children can be asked to group and colorcode the shapes they find (e.g. all triangles — red). To reinforce learning, kids can play a game with a partner or a team. Have them cut out and put all their shapes into a bag. In turn, each child pulls out a shape and names it. Keep score (one point per correct answer). Next, let the children try to name a shape first, then feel for it in the bag and pull it out to check their predictions. Keep score.

Students more experienced with geometry can identify obtuse, acute or right angles, altitudes, angle bisectors, solve area problems for basic geometric shapes and hybrid combinations — as well as prove congruent triangles.

Activities, dealing with symmetry and congruent shapes, can also be made appropriate. Have the children observe their unfolded paper airplane. Can they find a line (fold) that would divide the pattern into two matching pieces? This line is called, "a line of symmetry." The two matching pieces are said to be *symmetrical*. Distribute symmetrical pictures (butterflies, faces, certain leaves, houses, rectangles, circles, equilateral triangles) to the class, and let each student fold his picture along a line of symmetry to make both ends match. Have the students switch pictures with a neighbor to see if they agree. There may be some controversy when the rectangles get folded in different ways, for some figures have more than one line of symmetry. Can the children find symmetrical and non-symmetrical examples in the room?

Next, see if each child can find two shapes in his or her paper airplane that are exact copies of each other, so that, if one were placed on top of the other, they would fit exactly (coincide). These are congruent shapes. Whose paper airplane has the greatest number of congruent shapes?



The
Sage
First Annual Paper
Airplane
Competition

Flight School

Pilot

Competition Date   Flight Instructor

THE REAL THING
THE SAGE COMPETITION

Announce a Grand Prix competition. You may wish to include several contest divisions for the Sage Annual Paper Airplane Competition. In this way, success will be better distributed among more children. Pilots may compete in as many divisions as they *wish*. One plane design may be entered in more than one contest area.

For the competition, remove any constraints on uniformity of paper size, type or weight. Be prepared mentally and material-wise for free exploration. Among the suggestions you should be open to or willing to encourage are:

- ☐ decorating the plane with slogans, fearsome animals and psychedelic colors.
- ☐ changing the paper's size—from macroplanes to microplanes.
- ☐ changing the wing size in relation to the weight.
- ☐ using different construction materials: bond paper, poster board, cardboard, aluminum foil, tracing paper, paper towels, newspaper, sandpaper (friction effects).
- ☐ introducing propulsion systems. (Attach to the plane's fuselage, a cardboard ring surrounding the neck of a balloon with its opening facing the rear. To launch, blow up the balloon and release. The escaping air will propel the plane. Or, design a catapult. For example, reinforce the bottom edge of the fuselage with masking tape and fashion a hook from which a rubber-band slingshot device can operate.)
- ☐ changing wind speed. (Use an electric fan.)

At some point after the students have had enough time to experiment with their models, and when activity is winding down, stop the action, bring the class together in the pilots' lounge and challenge the whole "pilots' association" to make their planes climb, dive, turn sharply and roll. To achieve these maneuvers, students must learn to make changes in the control surfaces of their paper planes — a process which in flying circles is known as *trimming*.

Thus, on a more traditional model:

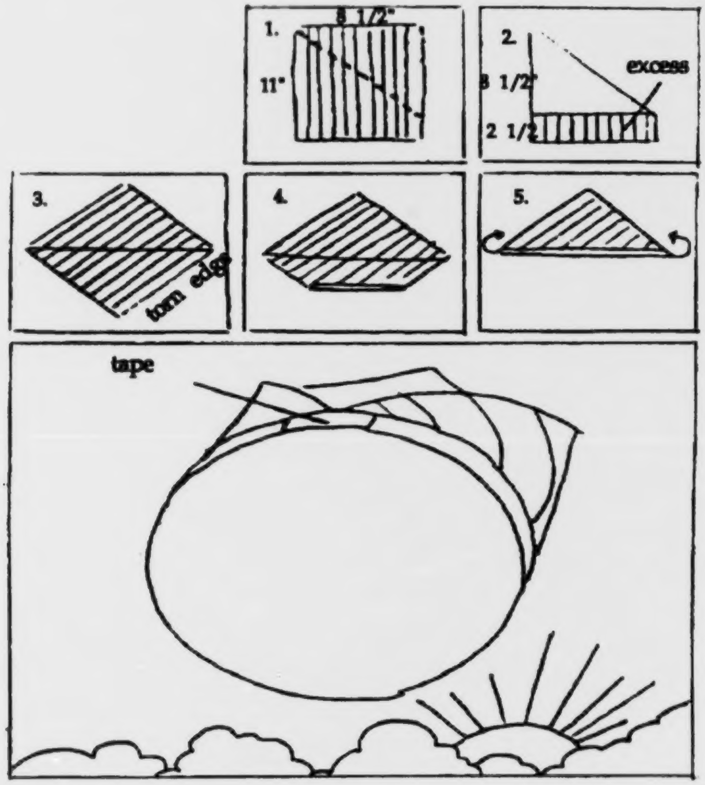
- ☐ warping both wings up or down (creating elevators) the plane dives or climbs.
- ☐ warping the end of the body (fuselage) to the left or right (creating a rudder) should make the plane turn.
- ☐ bending (in varying degrees) the end of one wing up, and the end of the other wing down (creating ailerons) should make the plane turn or roll.

UNUSUAL DESIGNS

Many students tend to be rather stereotyped in their approach to making paper airplanes. Until their creativity is nurtured, they seem to follow the same folding sequence. You may wish to inspire them by constructing a paper airplane that is a radical take-off from the usual.

Try this design using a standard 8 1/2" by 11" sheet of paper.

FLYING FUNNELS



To launch:
Hold the plane between your thumb and forefinger and launch gently with the tail of the "tube" on the

Experiment:

Use a paper clip for stability. Curl the tail up and down (like elevators).

1. Bring the upper right corner toward the left side so that the top coincides with the left side for 8 1/2".

2. Fold up the excess on the bottom; crease it and tear it off.

3. Reopen and rotate the 8 1/2 " square so that the fold is horizontal and the torn edge is on the bottom right.

4. Fold the tip 1/4" up and continue to fold up in 1/4 " steps parallel to the original horizontal crease until you reach that crease. Then flip the band you've formed once over the horizontal crease.

5. You now have a triangle with a thick base facing outward. Move the band back and forth until it is rounded.

6. With the folded band still on the outside , bring

BEST COPY AVAILABLE

AIR TRAVELERS

Traveling from one place to another is usually a very exciting thing to do. These air travelers may not go very far on their journeys, but getting them to their destination and back can make for some challenging problem-solving.

Experiment with the following problems to determine distance and direction of gliders and rockets.

NOTIONS, IDEAS AND CONCEPTS

When planning a scientific investigation, the variables associated with the phenomena under study must be identified, and then all but one must remain constant. To introduce this concept ask:

> *What effect would there be in the plane's flight if you were to change the size of the paper?*

Let the children planand execute a method for testing this question. Discuss what variables they have changed.

> *Who made only one change?*
>
> *What was it?*
>
> *How did it affect flight?*
>
> *Who made several changes?*
>
> *What were they?*
>
> *What conclusion can you draw?*

Some students will likely challenge the conclusion, citing that other variables did indeed change and may have caused the effect. Other concepts that may evolve on a practical or theoretical basis are:

-the main forces of flight

-air resistance, streamlining and friction

-center of gravity and stability

-equal and oposite action and reaction

Display books and set up experiments to demonstrate the concepts listed above.

MOBILITY AND MOBILES

If flying paper airplanes is such fun, surely making paper airplanes will be fun also. Mobile-making introduces children to the principles of balance, weight, and force (the weight acting downward and the string acting upward).

Start by having each student balance his or her paper airplane on his finger, and then balance a paper clip. Children will want planes to hang horizontally, to soar or to do a nose-dive. As they work at suspending the planes and other shapes in certain positions, the children will be exploring how an object's shape affects the way it hangs (i.e., weight distribution).

Tie one end of the yarn to the paperclip, hooked through the plane, and the other end, around a dowel. The yarn should slide for ease of balancing. To help the students learn how to suspend the dowels, let each one balance a dowel with two different-sized planes attached with an equal amount of yarn (the point of suspension will be off center).

If you really want to get "hung- up" on mobiles, try the challenge of creating one huge class of mobile paper airplanes. The idea is irresistible, mind boggling and frustrating.

Materials:

-one-quarter inch dowels, lengths of 8, 11, 14 and 17 inches

-brads

-colored yarn

-opened paperclips

GREATEST GLIDER

Materials:

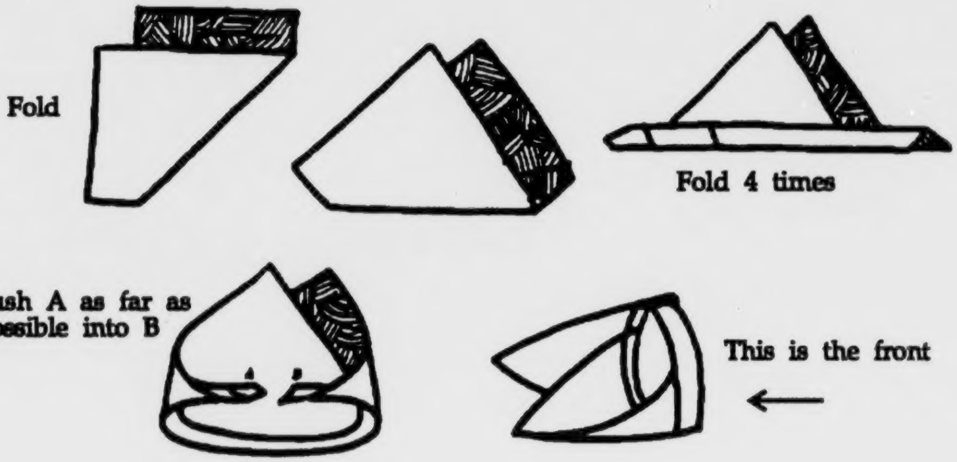
-Sheet of typing paper, notebook paper, or other equivalently weighted paper.

Problem:

Can you imagine a glider that looks as weird as this one, winning any contests for distance?

Starters:

If you lay your paper on a flat surface and follow these helpful hints, you too, will have a chance to explore this amazing glider.


Fold
Fold 4 times
Push A as far as possible into B
This is the front

What is the best way you can find to throw this glider? Is there a difference in throwing for distance and throwing to hit a target?

What Else?

Can you make the glider using other weights of paper ? How about newspaper?

What differences will there be if you start with a smaller or larger piece of paper?

What kind of targets could you set up to test the accuracy of your glider?

How about a contest for the most interesting design or the most colorfully decorated glider?

If you make a glider twice as big, will it go as far? Half as big?

Because of its unusual appearance, people might scoff at the flying ability of this glider, until they see it in action!

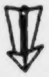
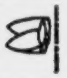
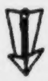
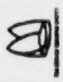
It might be interesting to get some opinions before they have a chance to see it fly. See if they judge it only on how it looks.

Make a regular airplane.

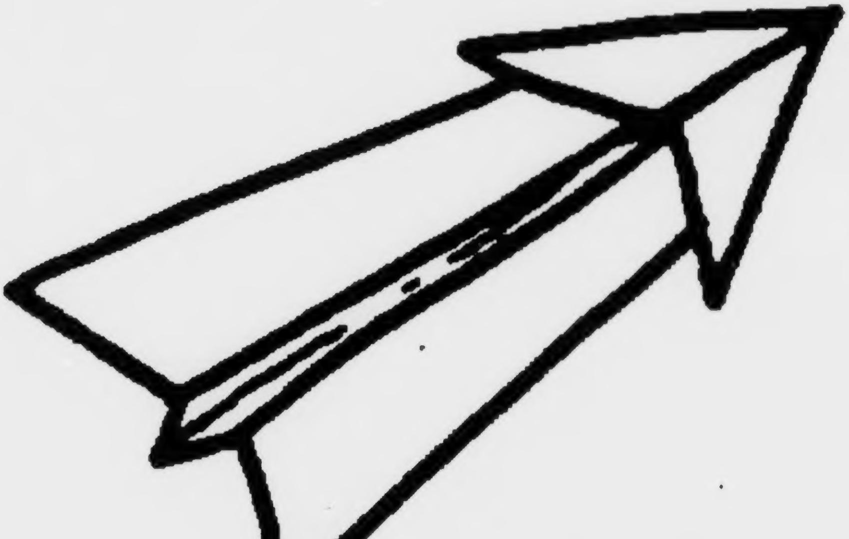
Show both planes to people of all ages. Ask relatives, parents, friends, classmates which airplanes they think will glide the farthest distance.

Enter their answers on the survey sheet below.

Put an *x* under the plane you think will glide a farther distance.

Name			**Name**		

*How did your survey turn out?*______________________



MINI- LAUNCHER

Materials:

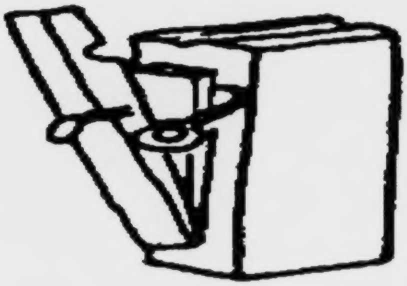
-wood block	-clothespin (pinch type)
-small wooden stick	-tape
-glue	-paper

Problem:

How far will a mini-rocket launched from a mini-launcher travel? You might be quite surprised!

Starters:

If you use scissors and cut off one "jaw" of a wooden clothespin, it can be taped to a wooden block (as shown in the picture) to make a mini-launcher.



We used the blade of the scissors to make a small groove in the top of the block.

The small stick has been included for the body of the mini-rocket. Cutting wings from paper and gluing them to the stick makes a great rocket. (For mini-targets, of course!)

If the rocket is set into the groove on the top of the wooden block, can you see how the clothespin is going to provide the boost for launching?

What Else?

Can you control the distance and direction of the rocket?

Does the position of the launcher affect the speed of the rocket? List other things that could be used for a rocket body.

If you added weight to the rocket, would it make a difference?

How could you set up a competition with rockets?

How would you advertise? Where would you display the information? Would you offer an award for rocket design?

Could contestants enter more than one rocket?

Launching two planes simultaneously might be a good way to judge the fastest rocket.

Name	Description	Distance	Height	Target

Rocket Statistics

AIR ROCKET

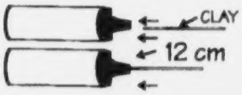
Materials:

- -fat strawn
- -plastic Bottle
- -glue
- -scissors
- -arrow straw
- -clay
- -lightweight cardboard

Problem:

Using the materials suggested above, can you assemble an air rocket?

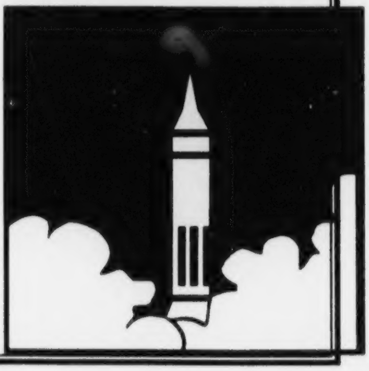
By making some changes, can you control the speed of the rocket? How about distance and aim? (Rockets aren't much good it they over-shoot the target.)



Starters:

If you shape a chunk of clay around the middle of the skinny straw, you can place it into the opening of the plastic bottle and your launcher will be fueled and ready. (What is the fuel?)

We have found that it works best to leave about 12 cm of the skinny straw sticking out of the launcher.



Cut the fat straw into pieces about 10 cm long, thus making two rockets from one straw. Four triangles of cardboard will make great fins. Try different weights of cardboard to determine which is best for your rocket. A nose cone of clay should complete your rocket, and the rocket will be ready to launch!

Launching:

Slide the rocket onto the launcher. Where will you aim it? Do you want it to go high, or straight? Squeezing the bottle injects the fuel into the rocket and sends it off into space. Did it go where you expected it to go? Was the distance what you expected?

Choose a target area. Can you control the distance and aim of your rocket so it hits the target? What things are important for accuracy?

What Else?

If you use a longer rocket, what changes will there be in the distance your rocket will travel?

Will a tall rocket go higher than a short one?

If you put two fins on the base, does it make a difference? Does the rocket travel faster? Straighter? What happens with *no* fins?

Try using a paper straw in place of a plastic one. What changes does this cause?

In the height it will travel_________

In the distance it will cover________

In the accuracy of its aim__________

If you were to put a planet (since they are hard to get, one drawn on paper would do nicely) on the wall and make ten tries to hit it with the rocket, how many tries do you think would be on target?

If you changed plastic bottles and used one with a different sized opening (larger or smaller) what do you think would be the effect on your rocket?

Could you find something to make a different nose cone? What changes do you think it would make in the rocket flight? How about styrofoam, paper, foil or gum?

Since many of the rocket problems deal with measuring things like height and distance, how would you make these measurements?

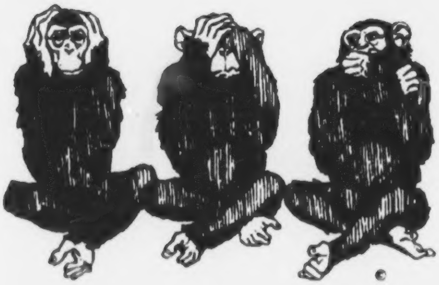
How would you measure how high your rocket went? If you wanted to tell exactly where it hit on a target area, how would you do this?

RESOURCES

Mander, et al. (1967). *The Great International Paper Airplane Book.* New York: Simon and Schuster.

Villalpando, E. (1980). *Project: Problem-Solving*. Phoenix, AZ: Think Ink .

ANIMALS



PROJECT SAGE

OVERVIEW

In Project Sage, we explore areas from which we can gain new learning experiences. Have you ever been curious about the behavior of animals? There are numerous questions to ask about the behavior of animals. Most of your questions will come under two basic groups: how and why.

OBJECTIVES

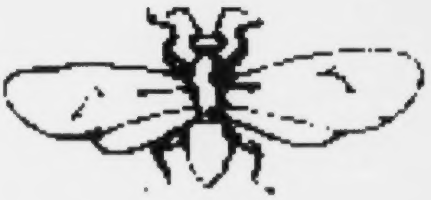
This section will motivate students to learn in three ways: from necessity, ambition, and curiosity.

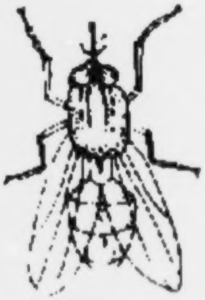
- ☐ Necessity: Students will study certain areas which will help them later in life.
- ☐ Ambition: Students will gain a strong desire to achieve and attain goals in their education.
- ☐ Curiosity: Students wil acquire an interest in studying a particular area because of its rarity. We are inquisitive and eager to acquire information or knowledge. Curiosity is one of the most valuable tools for learning.

ACTIVITY CARDS

On each card, copy the corresponding activity and give one card to each student, or to a group of students, hand out several cards that contain activities, or use your own imagination to decide how to use the cards.

Card 1 Imagine that you are wandering by a sand dune in July and come across some inch-long yellow and black wasps flying back and forth over the surface of the dune. You approach the dune more closely to see what they are doing. Several wasps fly up at you and buzz loudly about your head. You back off, advance once again, driven by a large interest in sand wasps.





The creatures buzz around again, but do not sting and are soon gone. As you inspect the surface of the dune, a wasp burrows straight up out of the ground, rapidly covers the exit hole with sand and flies off. After 10 minutes, a wasp comes darting toward you and then lands on the sand. The wasp holds a large brown fly underneath its body with its two middle legs. In a few seconds it has opened a tunnel into the burrow. As the wasp enters the burrow, its middle legs release the fly. A hind leg pulls the insect down the tunnel. The wasp re-emerges without the fly, and repeats its behavior.

As you watch, all sorts of questions run through your head. What are some of the questions?

Possible questions to be developed:

What were they doing with all those flies?

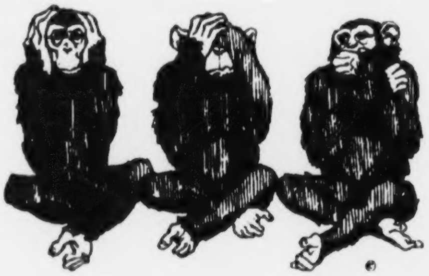
Why don't the flies resist being hauled in to the dunes?

How does the wasp grab a fly?

How does it manage to return repeatedly to the tiny hole in the sand dune?

Why does it cover up the hole each time it leaves?

Card 2 There are many animals located around the classroom. Choose an animal and observe its behavior. Keep a log in order to present your findings.



After observation, return to your seat and formulate questions about the behavior witnessed. All sorts of questions might be running through your head. Write these questions down. Share your observations with the class.

Card 3 Each person is to research a particular animal or group of animals. The research may be compiled in a booklet. Be creative and make your booklet as interesting as possible. Include topics such as the *Behavior of Animals; Animal Adaptation to the Various Environments; Where Animals Live; Animal Feeding Habits; Why Animals Look the Way They Do;* the Anatomy of Your Animal; *Does Your Animal Have Genes (like that of the bat's radar spectrum)? Can We Learn About Humans from Your Animal?*

Topics: Choose one or select your own:

-Fish—Animals of the Sea

-Snakes and Reptiles

-Animals in Research—Mice, Rats, etc.

-Toads and Reptiles

-Birds

-Insects

-Monkeys and Mammals

-Rabbits

Is your animal smart? Look into the psychological aspect of your animal (e.g., aggression, courtship, etc.)

Card 4 Animal Brain Teasers

What pine has the sharpest needles? A Porcupine.

What do you call a sleeping bull? A bulldozer.

What do animals use to hide from predators? Camelflage.

How do you get a dog to stop barking in the back seat of a car? Put him in the front.

What do you call a cow that sits on the ground? Ground beef.

Do you know me?

My ancestors were among the earliest dwellers of the West. My home is the yellow grassland, but I would also be at home in the desert or mountains. I share the grassland with coyotes and antelope, the lanky jack rabbit and the speckled, darting roadrunner. All know me and most of them fear me, though Iam neither large or powerfull. Indeed, I am shy and seldom seen. No one but the tiny, burrowing owl watches me now. Softly, silently, slowly, I crawl from my sheltered rock ledge where I spent the day sleeping and watching, watching and waiting, protected from the sun's heat. The twilight moon reveals that I am handsome - graceful and slender, cold and amber, olive and black. Moonlight shines upon my yellow eyes, which never close. My tail, with a ragged, broken tip will tell you that I am old. My skin is scaly, yet smooth. I am dangerous.

I am a prairie rattler.

Can you make up your own animal brain teasers? Remember to include the behavior of the animal in your description.

Card 5 Animals on Different Planets

Pretend you live on a planet other than earth. What are the animals like on your planet? Write a description of animal life on your planet. Draw illustrations to accompany your description.

Card 6 Modifying Animals

Who said that animals have the characteristics suitable for surviving within their environments? Choose an animal you think should be redesigned. What changes should be made? Reconstruct this animal using materials found in the art center. Be creative! Use your imagination! Your newly formed animal should have a name. You might write a short story, telling where your animal lives, what he does and what he eats.

Card 7 Evaluation

What was the most interesting information learned?

What activity did you enjoy the most? the least?

Would you like to be the same animal that you wanted to be before we started the unit?

What could have been done to make the unit more interesting?

Do you think the unit was worthwhile? Why or why not?

RESOURCES

Alock. *Animal Behavior*

Droscher, V. B. *The Magic of the Senses*

BEARS

PROJECT SAGE

OVERVIEW

Bears, Bears, Bears is a primary unit to familiarize children with bears in fact and fiction. The students read books about bears, their habitats, characteristics, etc. They also read fictional books that have bears as their main characters. Concepts are in literature, science, math, writing, and geography.

OBJECTIVES

The student will be able to:

- ☐ identify the following bears: polar, grizzly, panda, brown, and black.
- ☐ match the bear with the country it comes from and locate that country on a map.
- ☐ identify the following bears in fiction: Paddington, Corduroy, Winnie-the-Pooh and the Berenstain Bears.
- ☐ understand the meaning of the following terms: *carnivore*, *omnivore*, and *mammal*.
- ☐ know the origin of the term *teddy bear*.

PROCEDURE

The students will achieve the stated objectives by:

- ☐ looking through books, encyclopedias, interviewing people and visiting museums to gather information about bears.
- ☐ studying maps, globes, and atlases to find information about the countries where bears live.
- ☐ using the library card catalog to locate fictional books about bears.

ACTIVITY CARDS

Listed below are several activity cards for students to choose from.

Card 1	Read a bear book. Write the title and author. List 5 nouns, 5 verbs, and 5 adjectives from the story.
Card 2	Design a bear board game. (It can have bear markers shaped like a bear—use your imagination!)
Card 3	Invent a bear card game. It could be played like Old Maid, Concentration, or Go-Fish. The cards could be bear-shaped. Use your imagination. Get a partner to help!
Card 4	Make bears with thumbprints. (These make cute notepaper or cards. Make a set.)
Card 5	Design some bear bookmarks. Make a set. Give some to friends.
Card 6	Make a bear coloring book. (This could be put on masters.)
Card 7	Solve these problems on a separate paper.

Teddy Bear had 9 pots of honey. He ate 5 pots. How many pots were left? ________

Mrs. Bear sent Mr. Bear to the store for 10 items. He got 8. How many did he forget? ________

Teddy bought 3 lollipops each for 5 friends. How many lollipops did he buy? ________

Teddy hibernated 30 days in one month and 28 days the next month. How long did he hibernate all together? ________

Teddy has 12 pieces of candy. He wants to share with 2 friends. How many pieces will they each have? ________

Card 8	Make bear paper dolls.
Card 9	Stitch a book. Write a story about bears. It can be fiction or non-fiction.

Card 10 Find out about the constellations. Ursa Major and Ursa Minor. Share what you know by doing a report, a tape, a filmstrip or some other project.

Card 11 Imagine you went to Bearland. How did you travel there? What was it like? Draw a map of Bearland. Tell about life in Bearland: its government, its schools, its recreation. Design a flag for Bearland. Describe a sport or a game. Describe the schools. Describe a holiday. Write a song or national anthem.

Card 12 Shopping for the Teddy Bear's picnic .

Can you figure out the total price of each item listed on the picnic menu below? Then total them all for the complete cost of the picnic.

4 lbs. Salmon$1.29/lb
3 lbs. Honey$1.00/lb
2 pints Berries$0.79/pint
5 quarts Applesauce$1.19/quart
4 doz Honey Nut Bars$1.50/dozen

TOTAL COST$_______________

Card 13 Who's who? The famous bears match.

-The fire prevention bear
-The piano-playing bear on the Muppet Show
-He knows Tigger the Tiger
-The English story bear
-Youngest member of Goldilock's bear family

-Paddington
-Smokey
-Baby Bear
-Winnie-the-Pooh
-Fozzie

Card 14 Teddy Bears were named after President Teddy Roosevelt. Research and write a report on this president.

Card 15 Bears are mammals. List the characteristics of mammals. List other mammals.

Card 16 Bears are carnivores. Find out what carnivores are. List other animals that are carnivores.

Card 17 Read *Goldilocks and the Three Bears* to younger children (or act it out with words or pantomime).

Card 18 Make a cartoon: The Adventures of Super Bear.

Card 19 Suppose that, instead of becoming extinct in many areas, there were more bears than people in the world.

What problems would this create?

How could it be handled (without killing any)?

Card 20 Imagine you are a scientist who has trained and tamed a grizzly. Keep a log explaining how this was accomplished.

OTHER CLASS ACTIVITIES

The activities listed below are easy to put together; however, time consuming.

- Setting up a bear museum. The children bring in their stuffed or china bears. Each one is tagged "this bear belongs to . . . ." Other classes are invited in to view the bears. Children make bear-related work or color sheets for the visitors to take. Children can also make the bears with thumbprint(card 4) or the bear bookmarks (card 5) for this time.
- Tape some original bear stories for other classes to hear.
- Make a filmstrip, tape and worksheet of facts about different bears as an independent study unit for other classes.

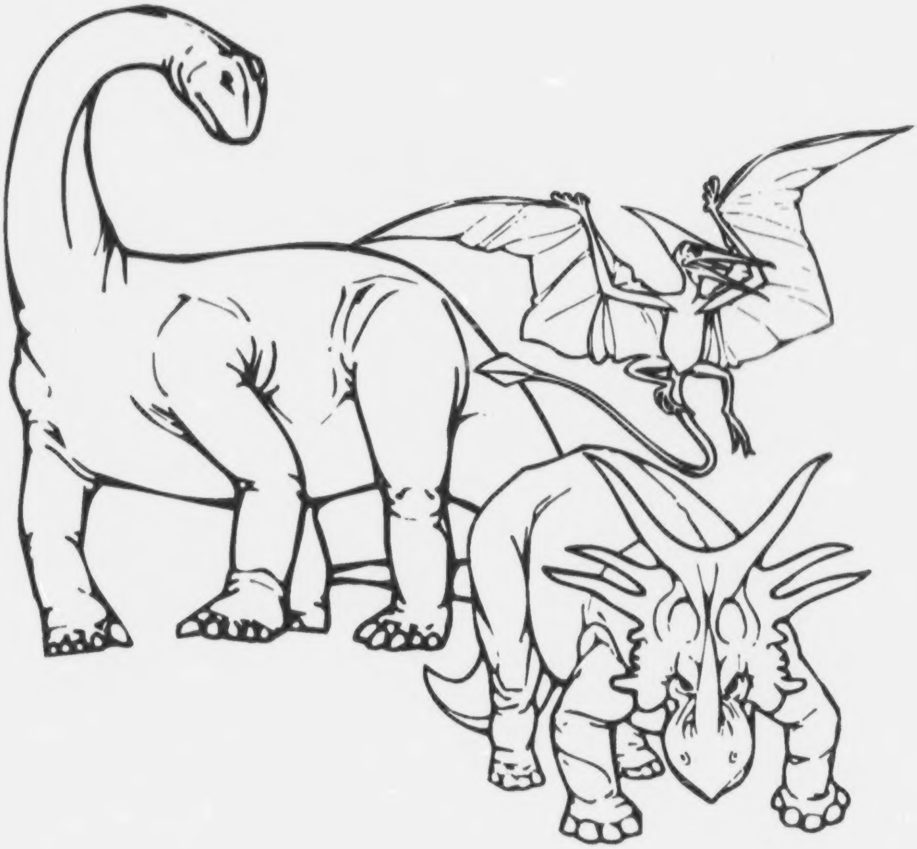
RESOURCES

bears' box which includes books and activity cards

library

maps, globes, atlases

DINOSAURS



PROJECT SAGE

OVERVIEW

The "dinosaur" unit enables the student to become familiar with different types of dinosaurs. Concepts are in science, social studies, math, and writing.

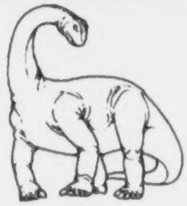
OBJECTIVES

The students will be able to

- ☐ identify dinosaurs by name.
- ☐ understand the terms: paleontologist, fossil, extinct, meat-eater.

The students will achieve the stated objectives by

- ☐ researching dinosaurs through books, encyclopedias, filmstrips, museum visits, tapes, worksheets, etc.
- ☐ doing a variety of the activity cards.



NAME ______________________________

DINOSAUR PRE-TEST

1. When did post dinosaurs live?

2. Are there dinosaurs around now?

3. Are there any animals around now that were alive when dinosaurs were?

4. What does extinct mean?

5. How do we know what we know about dinosaurs?

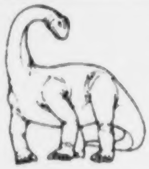
6. Name some dinosaurs. (Don't worry about spelling!)

7. What is a fossil?

8. What happened to the dinosaurs?

9. Are you interested in dinosaurs? What would you like to find out about dinosaurs? Where could you find out what you want to know? (Use back)

PALEONTOLOGY PUZZLERS



A team of paleontologists went on a dig. Help them solve some of the problems they had. Show your problem at the top of the page.

1. Dr. Smith found 27 bones at one site. She found 34 bones at another site. How many did she find all together?

   ____

2. One paleontologist found 64 bones. Another found 36 bones. How many more did the first find?

   ____

3. Dr. Brown had 296 bones to form a dinosaur skeleton. He knows there should be 420. How many bones are still missing?

   ____

4. Twelve scientists each worked at 3 different dig sites. How many site were worked in all?

   ____

5. The scientists shipped 4 boxes. Each box had 16 fossils in it. How many fossils were there all together?

   ____

6. There were 6 baskets filled with fossils. Each basket had the same number of fossils. There were 606 fossils in all. How many fossils were in each basket ?

   ____

ACTIVITY CARDS

On each card, copy the corresponding activity and give one card to each student, or to a group of students, hand out several cards that contain activities, or use your own imagination to decide how to use the cards.

Card 1 Classify dinosaurs by their eating habits, size or in other ways.

Card 2 Design and draw a new kind of dinosaur. Describe its habits.

Card 3 Choose your favorite explanation of why dinosaurs became extinct, or make up your own explanation and defend your position.

Card 4 Pretend you have a time machine that will take you back to the time of the dinosaurs. Describe what you see. Brainstorm ways to share this description.

Card 5 Ideas: tapes, news bulletin, play.

Card 6 List museums where you can find dinosaur fossils and bones. Locate these museums on a map.

Card 7 Idea: Write to some of the museums to request available materials or brochures.

Card 8 Write a book for young children about a friendly dinosaur and its adventures in the modern world. Design a cover.

Card 9 Do research to find out about famous places where dinosaur bones and fossils have been found.

Card 10 Make a bibliography of all the books in our library about dinosaurs.

Card 11 Make a model of a dinosaur. What kinds of unusual materials could you use?

Card 12 Make a mural showing as many different kinds of dinosaurs as you can. Find some friends to help you.

Card 13 Pretend you have discovered the lost burial ground of the dinosaurs. Describe what you see. Find an imaginative way to share this description.

Card 14 Think of all the ways you could convince your parents to let you have a dinosaur as a pet. Predict your parents' reactions. (This could be acted out as a skit or done as a pantomime.)

Card 15	Compare dinosaurs to modern animals. How are they alike? How are they different?
Card 16	Write a song about what it feels like to be a dinosaur.
Card 17	Design a dinosaur zoo, a Dinosaurland Amusement Park or a dinosaur board game.
Card 18	List all the possible uses for dinosaurs in the modern world.
Card 19	By scale, compare a dinosaur of your choice to modern animals, buildings, modes of transportation, etc. Make a chart or graph of your results.
Card 20	Make a diorama of a dinosaur scene.
Card 21	Conduct a survey to find out how many children enjoy learning about dinosaurs and, how many are not interested. You can graph your results by age, sex, classroom, etc.

MONSTER OR MYTH?

PROJECT SAGE

OVERVIEW

Given the opportunity to acquire, apply, analyze, synthesize and evaluate knowledge about monsters in a variety of ways, the student will engage in a rich and enjoyable experience integrating the arts and humanities.

OBJECTIVES

☐ The students will develope ability to distinguish fantasy from reality.

☐ The student will develope interest in monsters, make-believe and real.

MATERIALS NEEDED

☐ *Monsters Who's Who* by Dulan Barber (Crescent Books: New York 1974) and other books about monsters; selected classical music; selected art books; selected filmstrip-record dramatizations; materials for art and writing; equipment for making slides and tapes.

PROCEDURE

This unit iniates a study of monsters or myths. Monsters of every variety—real and make-believe—have an important place in human history, knowledge and belief. This unit of study can be initiated in a number of ways. One of the excellent books on monsters currently available may be shared. Or a television show or current movie might spark the students' already existing interest in monsters. The teacher's task is simply to cultivate and guide this interest so that it will yield the greatest possible richness of cognitive and effective experience.

ACTIVITIES

On each card, copy a corresponding activity and give one card to each student, or to a group of students, hand out several cards that contain activities.

Card 1 Encourage the students to find out as much as they can about monsters. Sources of information can be folklore and mythology, factual and fiction books, reference works, television and movies. A 3 x 5 inch reference card may be kept on different kinds of monsters, and filed alphabetically.

Card 2 Have students listen to music such as Moussorgsky's "Night on Bald Mountain" and Stravinsky's "Rite of Spring." Let their imaginations visualize the monsters suggested by the music.

Card 3 Allow the students to examine pictures of monsters in the fine arts, in books about ancient Egyptian and Mesopotamian cultures, classical civilizations, medieval bestiaries, space exploration, sea creatures and individual artists such as Hieronymus Bosch and Francisco de Goya.

Card 4 Have the students view and listen to filmstrip-record dramatizations of well-known stories dealing with monsters from folklore and mythology.

Card 5	Have students make a Monster Alphabet. Individuals can select and draw portraits of one monster for every letter of the alphabet. The portraits can be displayed with sentence-strip labels across one wall of the classroom. A brief, descriptive article about each monster may be included. When the display is taken down it may be made into a permanent scrapbook for the class and shared with primary grade students.
Card 6	Students may tape an auditory Monster Alphabet. Each monster name, preceded by an alliterative description word (Abominable Anthropophagy ... Biliocis Blob... Circumnavigating Cyclops) may be expressively spoken, followed by an appropriate brief musical selection. The tape may be used by students to teach younger children a lesson in creative movement.
Card 7	Have some students (who are interested in photography) copy art prints previously studied, using a 35-millimeter camera and a copy stand. Students will have assembled a slide collection of monsters in the fine arts.

Card 8 Students may select to dramatize "Beauty and the Beast," "Perseus and the Gorgon," or some other well-known story.

Card 9 Have students develop, analytically, a comprehensive definition of monsters that may include specific characteristics which identify monsters.

Card 10 The dictionary recognizes the following characteristics as possible indicators of monsters:

-abnormal form or structure

-enormous size and/or

-excessively wicked or cruel behavior.

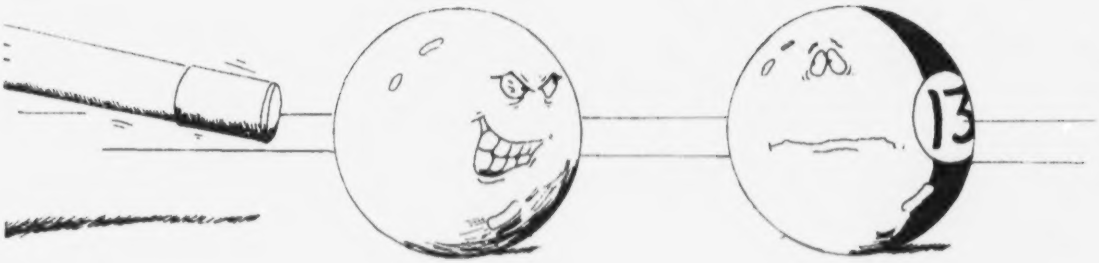
Card 11 Have students classify the full spectrum of monsters they have studied, according to the standard system above. In addition, students will categorize monsters in as many ways as they can think of.

Card 12 Have the students analyze for logical soundness and adequacy of evidence, arguments for or against the existence of Bigfoot (Yeti, Abominable Snowman), the Loch Ness Monster, and other disputed monsters.

Card 13 Compose and perform songs about monsters.

Card 14	Create a fantasy-world mural populated with student-invented monsters; these could be polymorphic creatures, composed of parts of natural animals — but in unnatural combinations.
Card 15	Write original fantasy fiction or write and dramatize an original play with monsters as characters.
Card 16	Students can compile all their knowledge about monsters, to create and produce a multimedia presentation for other classrooms.
Card 17	Evaluation: *How can we tell whether a monster is real or make believe?* *What are the tests for reality?* *How important have monsters been in human affairs throughout history? Why?*

SIR ISAAC NEWTON:
Introduction to Physics



PROJECT SAGE

OVERVIEW

This is a primary unit designed to familiarize children with Sir Isaac Newton and his laws of motion.

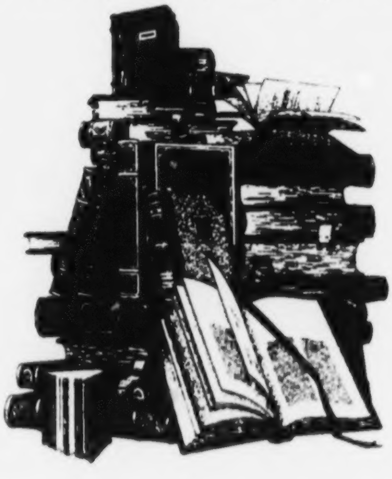
OBJECTIVES

- ☐ The children will learn who Sir Isaac Newton is and the nature of his work.
- ☐ The children will learn the three laws of motion and be able to give examples of each.
- ☐ The children will conduct experiments to test each law and learn to record their data in a scientific manner.

PROCEDURE

The students will achieve these objectives by:

- ☐ researching Sir Isaac Newton using a variety of sources; books, encyclopedias, interviews, filmstrips, etc.
- ☐ doing the accompanying activity cards.
- ☐ reading the appropriate sections of *How To Do A Science Project and Report* by Martin J. Gutnik and by utilizing skills learned in the SCIS science program.



ACTIVITY CARDS

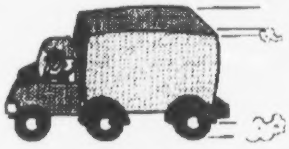
On each card, copy the corresponding activity and give one card to each student, or to a group of students, hand out several cards that contain activities.

Card 1 Research Sir Isaac Newton and write a brief report about him. Decide how you will share this report with the class. (Suggestions: tape, worksheet, filmstrip, play.) Perhaps you could pretend that you were Sir Isaac Newton and do the report as an autobiography.

Card 2 Learn Newton's three laws of motion (on card numbers: 3, 4 and 5). Conduct one experiment for each law. (Do each experiment several times for validity.)

Card 3 Newton's first law states that a body at rest tends to remain at rest, or a body in motion tends to remain in motion at a constant speed, in a straight line unless acted on by an outside force—called inertia. In other words, an object keeps doing what it is doing.

Stop

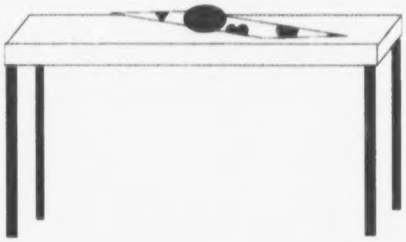


Truck

Inertia Experiment 1

Materials: glass, playing card, marble or super ball

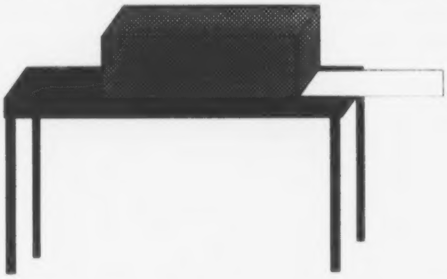
Place card on glass and ball, or marble on the card. Flick the card away quickly and the ball will fall into the glass. Record what happens.



Inertia Experiment 2

Materials: block of wood, piece of paper

Put a piece of paper on a table with half of the paper off the edge. Put a block of wood on it. Pull the paper away fast. The block of wood will stay in place. Record what happens.



Card 4 Newton's second law of motion states that it is easier to change the speed and direction of a light object than a heavy one. The more force you use, the faster the object will change speed or direction.

Experiment I

Try throwing a basketball, a baseball and a nurf ball with the same speed. Measure the distance of each. Record results.

Experiment 2

Try throwing the same balls with as much force as you can. Measure the distances. Record results.

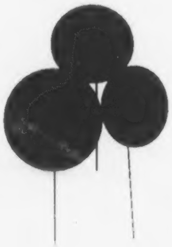
Card 5 Newton's third law of motion states that for every action there is an equal and opposite reaction. Examples:

Action	Reaction
-stepping ashore off boat	-boat bobs away
-frog jumping off lily pad	-lily pad bobs under
-water passing through a rotary lawn sprinkler	-nozzle revolves, pushed away by force of water

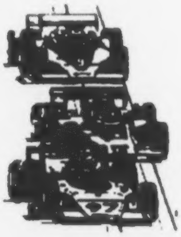
Experiment 1

Stretch a rubber band between the thumb and the first finger of one hand. Now push against the rubber band with the first finger of the other hand. Record what happens. Change the amount of pressure. Record what happens.

Experiment 2



Blow up a balloon and release it. Record what happens. Vary the amount of air and record what happens.



Card 6 Brainstorm a list of as many examples of objects in motion as you can.

Card 7 Design a racing car that will best show Newton's second law of motion.

Card 8 Do a program based on the television show "To Tell the Truth." Have three people pretend to be Sir Isaac Newton. Four other people would be panellists who question and try to guess the real Sir Isaac Newton. You would also need an M.C. (Master of Ceremonies).

Card 9 Pretend you are a journalist. Conduct an interview with Sir Isaac Newton.

Card 10 Design a word search using the following words:

-inertia

-Isaac

-experiment

-action

-body

-motion

-Newton

-force

-reaction

-gravity

RESOURCES

Feravolo, R. *Wonders of Gravity.*

Fisher, S.H. *Table Top Science: Physics Experiments for Everyone.*

Gutnik, M. J. *How To Do a Science Project and Report.*

Hone, J., & V. A. *Sourcebook for Elementary Science.*

Jacobson, Konicek, Lauby. *Forces and Magnets.*

Seymour S. *Motion.*

THE SCIENCE OF MUSIC

PROJECT SAGE

OVERVIEW

Students will have the opportunity to build their own simple musical instruments as well as perform a number of experiments with sound. Students will explore the world of musical instruments in terms of the many branches of science— physic, chemistry, etc.

OBJECTIVES

☐ Students will note the rhythm that exists in speech, poems, stories, lyrics. Students will determine where rhythms exist (rainfall, walking, etc.).

☐ Students will design drums of different sizes. Drums have always been used to tap out rhythms. Students will also distinguish the sounds made from the various sized drums.

☐ Students can picture rhythms using symbols invented by Egyptians.

☐ Students will investigate and construct different types of rhythm instruments— claves, maracas, scrapers, gongs, tambourines, bones.

☐ Students can create a one-man band with all the percussion instruments. Students will listen to the different sounds of their instruments and distinguish the sounds.

☐ Students will listen to many kinds of music on radio, television, at the movies, or on their record player. Students will listen to live music to become aware of different sounds and how they are produced.

☐ Students will experiment with sounds by making instruments including: bugle, reed instruments, flutes, panpipes, xylophone, stringed instruments, etc.

☐ Students will, together, compose music that may lead to many new ideas. Students may create their own music for a drama in movement. Students will think of movements that dramatize their theme and find friends to help them in planning. Students will experiment with how they think the movements should be, then begin to put music with the action.

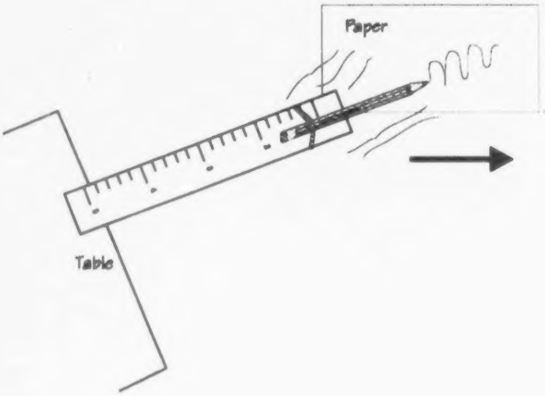
☐ Students will apply research skills when investigating composers, vibration and sound waves, the history of the phonograph, the human voice, etc.

PROCEDURE

It is suggested that this unit be presented in a learning center. Many of the activities call for students to work individually or in small groups, conducting research and becoming involved in experimentation. Activities contained in this unit should be listed on activity cards and posted in a designated corner of the classroom. All necessary materials needed to carry out the activities should be made readily available.

SOUND WAVES

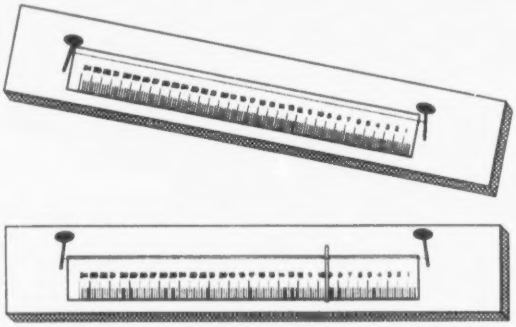
You can see sound waves if you have some phonograph records and a magnifying glass. Find a record marked 78 RPM and look at it through the magnifying glass. You'll see the sound waves as grooves cut into the record.



Even though they are invisible, we can draw pictures of sound waves. Imagine a pencil attached to a vibrating end of a yardstick. As it vibrates up and down, imagine pulling a piece of paper past the pencil. The pencil would then be drawing a picture of the invisible sound waves. Try this experiment yourself.

TONE QUALITY

To understand tone quality, or to know why a trumpet sounds different from a piano, you should know a little about overtones. When you hear a note, besides the basic note, there are higher notes that blend in with the basic note. These higher notes are overtones.



You can experiment with overtones if you build a very simple ancient instrument called a monochord. To build a monochord, you need some nylon fishing line, two nails, a yardstick and a strip of wood about 40 inches long and 1/2 inch thick.

Put the yardstick on the board. Next to the ends of the yardstick, drive in nails part way. The nails should be exactly 36 inches apart. Bend the tops of the nails toward each other, and tie the nylon line near the heads of the nails. Then slide the knots to the bottom of the nails and straighten the nails out. Now slide the knots up so the line is tight, and about 1/2 inch above the board.

Saw two inches off the yardstick, cutting at the 34 inch mark. Now put the yardstick under the string, with the zero mark against one of the nails.

Stand the two-inch piece of yardstick, which you cut off, on edge at the nine-inch mark, dividing the string into one quarter and three quarters. Put little folds of paper at 13 1/2, 18, 22 1/2, 27, and 31 1/2 inch marks.

Pluck the string gently on the other side of the wood.

What do you notice about the papers at the five marks listed above?

Does the whole string vibrate?

In how many sections did the string vibrate?

Note the likenesses and differences in sound between the five groups of instruments:

-strings,	-woodwind,
-brass,	- percussion,
-keyboard	

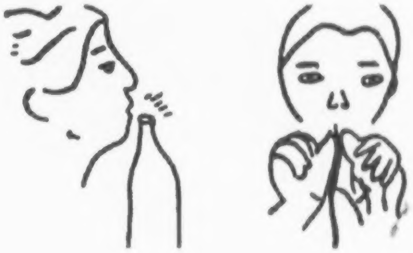
RHYTHM INSTRUMENTS

Investigate the various types of rhythm instruments:

- -cymbals
- -scrapers
- -gongs
- -bones
- -claves
- -maracas/castanets
- -triangles
- -tambourines
- -drums of different sizes

Directions for assembling these instruments are in the Music Activity Box.

Create a one-man band with all the rhythm instruments you will make. Listen to the different sounds of these instruments.



BOTTLE BLADE OF GRASS

If you held a blade of grass between your thumbs and blew on it, getting a high, piercing sound, you would be playing a woodwind instrument.

Length helps to determine pitch. When the column of air is long, you get low notes. When the column of air is short, you get high notes.

You can see how this works if you have three empty soda bottles, all of the same size. With them, you can play a simple melody. Leave one bottle empty. Put two inches of water in bottle 2. In bottle 3, put about three inches of water.

Before you play any of them, can you guess which bottle will have the highest note? The lowest note?

THE BRASSES

Vibrating Lips Experiment

You can learn more about the bugler's vibrating lips if you have a balloon. Imagine that the balloon is the bugler's lungs, and the opening of the balloon, the bugler's lips. As you let the air rush out of the balloon, it is the same as the bugler expelling the air from his lungs. This rush of air makes the opening of the balloon vibrate somewhat in the same way as the bugler's lips. If you stretch the balloon opening, the vibrations are faster.

What happens to the pitch?

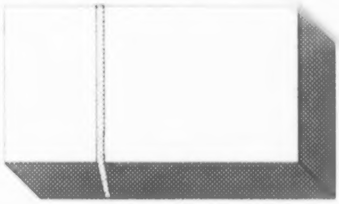
STRINGS

Strings are set into vibration by using a bow. Sound is built up by reflection of the vibrations within the body of the violin. You can try reflection. Place a rubber band around a box. Pluck the band and listen for the loudness. Now slide two fingers along the sides of the box, raising the rubber band above the box. Pluck it again.

What has happened to the sound?

Why do you think this has happened?

You can see how pitch works by trying a simple experiment. Stretch a rubber band around an empty cigar or shoebox. Pluck the rubber band around the box. Listen to the note it makes. Now, with two fingers of the other hand, pinch the rubber band near the end. Hold it there while you pluck the rubber band in the same way as before.



Does this note sound higher than the first?

What hypothesis can you make?

Try pinching closer to the center and pluck again. What happened?

INSTRUMENTS

Experiment with sounds by making the followingiInstruments:

-ear harp
-horns
-recorder
-panpipe
-one-string guitar
-wind chimes
-whistle
-washtub bass
-clorox-bottle banjo

The recipes are located in the center's file.

UNUSUAL INSTRUMENTS

Explore some of the following unusual instruments:

-lute
-lyre
-dulcimer
-anvil
-shawn
-flageolet
-cittern
-archlute
-tabor or taboret
-clavichord
-cor anglais

OTHER KINDS OF ACTIVITIES

The Ear and Hearing

How are we able to hear sounds?

Trace the passage of sound through your ear.

What does the science of acoustics deal with?

Research: Explore the life and music of one of the following composers:

-Johann Sebastian Bach

-Wolfgang Amadeus Mozart

-Ludwig Van Beethoven

-Johannes Brahms

Choose a favorite composer of yours and share your knowledge with the class.

Learn More About Vibration of Cymbals and Gongs

If you have a large metal plate or tray, you can learn more about vibrations of cymbals and gongs. Cover the plate with a thin layer of sand. Draw a piece of sandpaper gently across one edge of the plate and place your fingers on the opposite edge. The sandpaper generates waves in the plate by alternately sticking and slipping. These waves travel across the plate and are reflected from its edges.

If you watch the sand, what do you notice?

What happens to the sand on the plate?

Recording Sessions

Trace the journey of the live sounds in the recording studio to the finished record.

How is it possible for you to hear your favorite rock group on your own phonograph at home?

Music Compositions

Try composing music together. It can lead to many new ideas. Create your own music for a drama in movement. Think of themes such as "Voyage into Outer Space." Think of movements that dramatize your theme. Experiment with how you think the movements should be. Then begin to put the music with the action.

The Orchestra

Set up your own modern orchestra. Draw a diagram to show where and how instruments should be arranged. Use you knowledge of sound to aid you.

Live Music

Listen to many kinds of music on the radio, television, at the movies or on your record player. Listen to live music to become aware of different sounds.

Voice

How we are able to produce sounds? Discuss this wonder of our human body.

Use your musical arrangements in your puppet plays and theater presentations.

CELEBRATING AUTHORS' BIRTHDAYS

Happy Birthd

PROJECT SAGE

OVERVIEW

The Celebrating Authors' Birthdays activities allow children to develop an appreciation of literature, while discovering similarities and differences among authors and illustrators. The students will learn conepts of literature, art, drama, and writing.

OBJECTIVES

The student will be able to :

- ☐ define the terms: *author, illustrator, fiction, non-fiction, biography and autobiography.*
- ☐ associate various authors with books they have written.
- ☐ recognize at least two illustrators by their work.

PROCEDURE

The students will achieve objectives by:

- ☐ Learning library skills, using *Getting to Know the Library,* Books A and B, and Scholastic Book Services.
- ☐ Choosing an author and/or illustrator to read and research.

AUTHORS' BIRTHDAYS

September	
13th	Else Minarick
13th	Ronald Dahl
15th	Tomie de Paola
15th	Robert McCloskey
16th	H.A. Roy
October	
4th	Donald Sobol
6th	Steven Kellogg
19th	Ed Emberly
November	
26th	Charles Schultz
December	
28th	Carol Ryrie Brink (Caddie Woodlawn)
January	
3rd	Joan Walsh Anglund
18th	A.A. Milne
30th	Lloyd Alexander
February	
4th	Russell Hoban
7th	Laura Ingles Wilder
19th	Slobodkin
24th	Wilhelm Karl Grimm
March	
2nd	Dr. Seuss
11th	Ezra Zach Keats
28th	Byrd Baylor
April	
2nd	Hans Christian Anderson
12th	Beverly Cleary
27th	Ludwig Bemelmans
May	
5th	Leo Lionni
9th	William DuBois
22nd	Arnold Lobel
June	
10th	Maurice Sendak
26th	Charlotte Zolotow

ACTIVITIES

On each card, copy the orresponding activity and give one card to each student, or to a group of students, hand out several cards that contain activities.

Card 1	Make a list of all the books by the author. (Alphabetize them.)
Card 2	Do a stitchery of a scene from different books or different scenes from one book.
Card 3	Choose four or five books by the author. Conduct a survey to find the favored book and graph the results. (Variation: Predict how many children will know the author and be able to name the books written by the author.)
Card 4	Choose a book and rewrite the ending or write a sequel.
Card 5	Design a birthday cake for the author using characters from his or her story/stories. (Variation: Design a whole party - favors, napkins, games to play - all on the theme of the author and his or her characters.)
Card 6	Make and send a birthday card to the author.
Card 7	For authors/illustrators such as Leo Lionni and Tomie de Paolo, do a painting in their style. (Stress that this does not mean copying exactly.)
Card 8	Choose a story by the author and rewrite the ending.
Card 9	Act out an interview with the author or a character from the author's book. (Variation: Act out a character and have other children try to guess who it is.)
Card 10	Make a list of questions you would ask an author if you ever met him or her.
Card 11	Compare and contrast any two authors. (Variation: Classify the books of two authors in a usual and an unusual way. Use your imagination!)
Card 12	Write a song about the author, his or her books and the characters.
Card 13	Write a commercial advertises the author and his or her books.
Card 14	List qualities that make a book interesting and enjoyable. Evaluate a book according to your qualifications.

WAYS TO SHARE BOOKS

Puppet Shows

Plays

Bookmarks

Crossword Puzzles

Comic Strip Summaries

Mobiles

Murals

Collages

Word Searches

Biographies - Do a "This is your Life" skit. Dress as the person.

Sequels

Maps

Roll-Movie

Life-Size Picture

Diary

Book Jackets

Filmstrip

Pop-Up Book

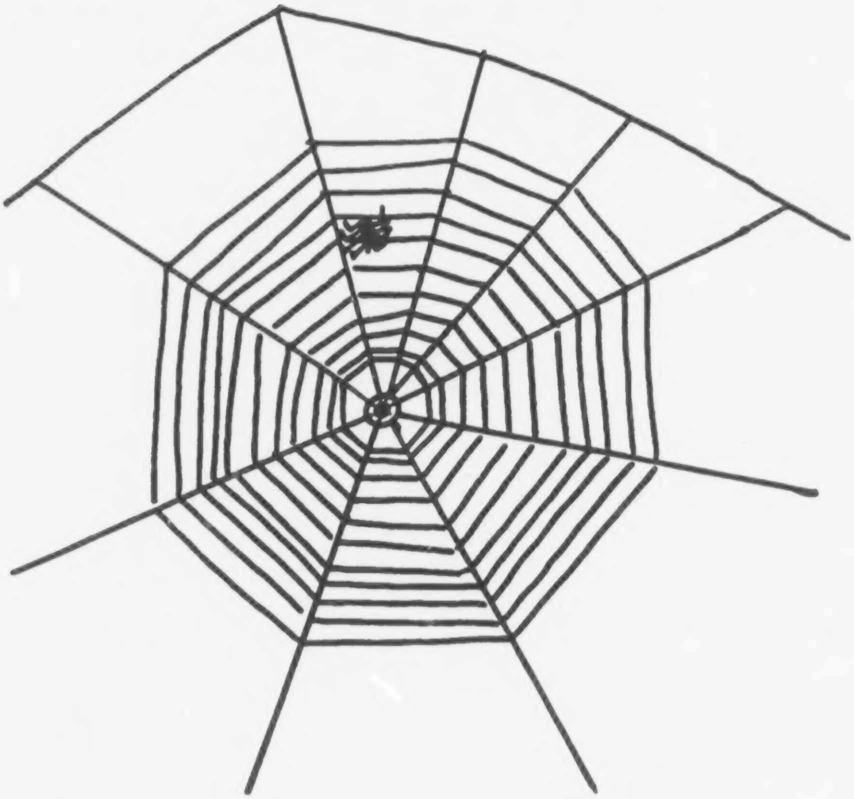
Timeline

Diorama

Make a game based on the book *Clay Models*.

CHARLOTTE'S WEB

by E.B. White



PROJECT SAGE

OVERVIEW

Byadapting a portion of *Charlotte's Web* for presentation as a play, a number of goals can be coordinated into the study unit.

First, by having the students read the book in its entirety, they would be able, perhaps for the first time, to read, analyze and discuss a complete work of literature as opposed to an abridgement or excerpt. *Charlotte's Web* is not only a wonderful story, but deals with larger issues (actually the largest issues)—life and death. A discussion of life and death and other evaluative topics (love, friendship, fear, hate) would stimulate any student, to consider and evaluate his or her own feelings and fears. Often, important, but sensitive topics such as the life and death cycle, are generally avoided in most basic reading programs.

A portion of the book has been adopted into play form to introduce the students to the theater and to the logistics of producing a play. In this portion of the unit students will learn about the format of the stage and the relationship of action on stage to placement on stage. A warm-up simple play, perhaps an impromptu skit, would be used to illustrate the importance of proper stage blocking and movement.

A finished product of a quality superior to many grade school productions can be achieved by working with the children on several basic acting techniques: pantomime, voice and character projection and body language. This should be a fun and creative experience for the children, as so many of the children seem to enjoy "hamming it up" and have a natural aptitude for performing. It would also give the students an opportunity to improve their oral expression and confidence.

Other aspects of the production, especially creation of set, scenery and props, would allow those students with talent in the visual arts to play an important role in its success.

Finally, creative projects following production would ease the possible feeling of "let down" the students might have after a production "high." Hopefully, interest in the subject matter of *Charlotte's Web* and its possible extensions into other fields of endeavor can result in further creative research projects, and will stimulate a love for the theater as a creative and expressive art form.

In conclusion, this enrichment unit has many topics that the literature suggests are significant for discussing with gifted children. Briefly, these would include creative and evaluative thinking, "hands on" projects, freedom in decision making and initiation of design, opportunity for oral expression, introduction to a new art form, as stimulus for further outgrowth of creativity and research interests, and finally, the chance to "shine" in front of an audience of peers.

CHARACTERIZATION

Here are some adjectives that could describe some of the characters in *Charlotte's Web*. Pick three words which best describe each of the characters listed below, with the most important characteristic first, least important last. Be sure you are able to justify your choices.

Adjectives childish, cruel, emotional, evil, generous, happy-go-lucky, hard-hearted, kind, loving, mean, practical, protective, smart, strong, stupid, vain, weak, wise

NOTE: You may use antonyms to describe one character. If you are unsure of the definition of any word, check it in your dictionary. (Some words may have more than one meaning.)

Characters

Charlotte

Gander

Goose

Lurvy

Old Sheep

Templeton

Wilbur

Purpose of Worksheet: To prepare the students to discuss the characters before the students read the play. It makes the student choose from a limited number of words and evaluate each character. It also helps the teacher check a student's comprehension of the story.

CHARACTERIZATION WORKSHEET

If you could play a character in our production, which one would you like to be? Explain why.

☐ Charlotte ☐ Gander ☐ Goose ☐ Lurvy

☐ Old Sheep ☐ Templeton ☐ Wilbur

DISCUSSION TOPICS

(for students after reading the book of *Charlotte's Web*)

Presemably, many students have already read the book. However, a short discussion of the important elements in the book would be helpful, as the students never get the opportunity to read a book in its entirety from the basal reader. To avoid detracting from the charm and freshness of the story, limit the discussion. Some possible topics for discussion are:

What characters grow and change during the course of the story? Which ones stay the same?

Was Fern's father an evil man for wanting to kill Wilbur as a baby? In Fern's eyes? In your eyes?

If you were making a recording of the book, what do you think the voices should sound like to reflect each character?

Did you like the book?

How did you feel about Charlotte's death?

Were you afraid that Charlotte's plan to save Wilbur would not work? Were you surprised at her plan? Did any of you think of your own plan to save Wilbur?

It is ironic that at the beginning of the story, Wilbur is afraid to die, and at the end, he is willing to give up his life to save Charlotte. What do you think that shows about Wilbur?

Would you wish to change any part of the story? If so, why?

DISCUSSION AND LEARNING TOPICS
(prior to production)

- Knowledge of stage terminology (see charts)
- Necessary props
- Scenery suggestions and creation
- Placement on stage relative to importance of action on stage and furtherance of story
- How to make a character "come alive" on stage
- Blocking, avoiding awkwardness and upstaging
- Basic acting techniques (downstage hard, how to turn around on stage, avoiding turning one's back to the audience)
- Importance of pantomime
- Staying in character, especially when not speaking
- Voice and character projection
- Body language

CREATIVE AND RESEARCH PROJECTS

(following production)

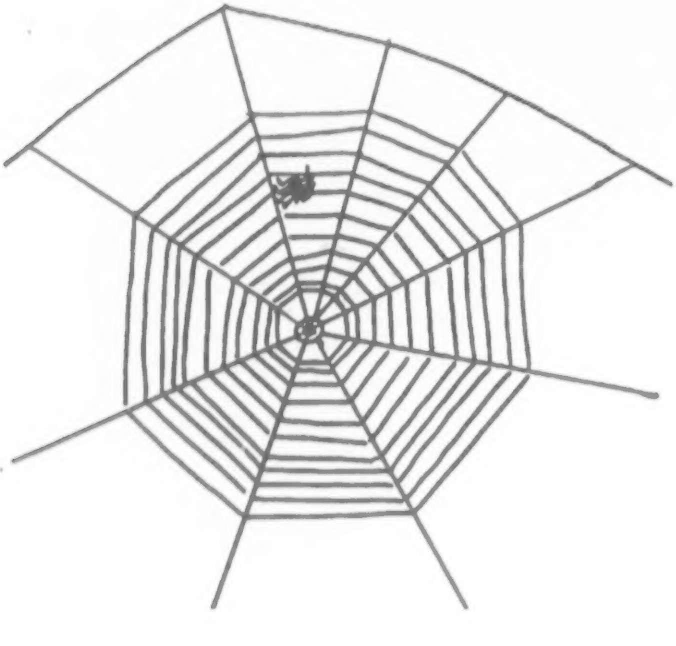
- Take one of the other characters in the story and write an original short story about him or her.
- Write a short play from one of your favorite books or stories.
- Do some original illustrations.
- Write about whether or not you think you would like to live on a farm.
- Write your own songs or poems to add to the story.

Suggested Research Topics

- A cost analysis on raising a baby pig
- How do animals communicate?
- Spiders
- Read *Stuart Little*. Compare author's purpose, content and style.
- Compare *Charlotte's Web* with another animal story.
- Study the life cycle on a farm or of a particular animal of your own choosing.
- Modern set and stage design

Charlotte's Web

A Condensed Play



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SCENE 1

SETTING: Farmyard, pig lying in hay crying. There is a trough with a pile of junk underneath. A goose is sitting quietly on her eggs.

Wilbur: Oh me, oh me. No friends, no one to play with. I've asked the goose here, the sheep and the lambs, even that no good rat Templeton. I'm so lonely I can't stand it. What's a pig to do-o-o. Ever since I left Fern's farm, my life has been miserable. I can't sleep, I can't even eat, and that's saying something for a pig.

Charlotte: Do you want a friend, Wilbur? (Wilbur gets up, wildly looking around for the figure behind the voice.) I'll be a friend to you. I've watched you all day and I like you.

Wilbur: But I can't see you. (Looking around) Where are you? and who are you?

Charlotte: I'm right up here. Go to sleep. You'll see me in the morning. (Charlotte sings a lullaby.)

I'm right up here above your head.
So you can hear everything I've said.
Now close your eyes and go to bed
Tomorrow is soon enough.

SETTING: Wilbur restlessly tries to sleep, turning, tossing, grunting, singing 'Tomorrow is soon enough' under his breath. Rat scurries across the stage, making a racket adding to his pile of junk underneath the trough.

Wilber: Templeton, why do you have to stay up all night grinding and clashing? Why can't you go to sleep like any decent animal?

Templeton: (Stops midway with junk in mouth, drops it with a clang to speak) What's it to you, Fatso? I like to spend my time eating, gnawing, spying and hiding. Right now I'm on my way to eat your dinner since you don't have the sense to eat it yourself. Heh heh, bye bye. (Templeton goes to eat dinner, slurps and slops noisily, burps, finally finished, crawls under the trough to sleep, snoring. Meanwhile, Wilbur tries to cover his ears to block off the noise, finally falls into a restless sleep.)

Wilbur: (Suddenly starts and wakens) What time is it?

Goose: Probably bably-obably about half past eleven. Why aren't you asleep, Wilbur?

Wilbur: Too many things on my mind.

Goose: Well, that's not my trouble. I have nothing at all on my mind. But I've too many things under my behind. Have you ever tried to sleep while sitting on eight eggs?

Wilbur: No. I suppose it is uncomfortable. How long does it take a goose egg to hatch?

Goose: Approximately-oximately thirty days, alltold. But I cheat a little. On warm afternoons, I just pull a little straw over the eggs and go out for a walk.

Wilbur: (yawning) Oh, that's nice. I think we should both try to sleep, don't you? (Goose nods agreement. Both try to settle in to more comfortable positions. Presently everything is quiet, gentle breathing is heard. Lights darken for the night and then slowly come up as day breaks.)

Wilbur: (Jumps up out of sleep, squealing with excitement) Oh beautiful day it is here at last! Today I shall find my friend.

A friend for me
A friend to see
A friend to be
For eternity.

To skip and play
And just to say
Hello, okay?
To start the day.

Wilbur: (Wilbur looks high and low for his friend—some humor possible here.) Finally he decides to speak up.

Attention, please! Will the party who addressed me at bedtime last night kindly make himself or herself known by giving an appropriate sign or signal!

(Wilbur waits and listens, other animals groan, "Quiet in there," "pipe down," etc.)

Wilbur: Attention, please! I will repeat the message. Will the party who addressed me at bedtime last night kindly speak up. Please tell me where you are, if you are my friend!

Sheep: (Sheep enters, angrily baaing) Stop your nonsense, Wilbur! If you have a new friend here, you are probably disturbing his rest; and the quickest way to spoil a friendship is to wake somebody up in the morning before he is ready. How can you be sure your friend is an early riser?

Wilbur: (in a small voice) I beg everyone's pardon. I didn't mean to be objectionable.

(Wilbur lies down, Lurvy comes in with his breakfast. Wilbur eats hurriedly, takes another look around hopefully, sighs, settles back down for a morning nap)

Charlotte: Salutations

Wilbur: (Jumping up) Salu-what?

Charlotte: Salutations!

Wilbur: (wildly circling around) What are they, and where are you? Please, please tell me where you are. And what are salutations?

Charlotte: Salutations are greetings. When I say salutations it's just my fancy way of saying hello or good morning. Actually, it's a silly expression, and I am surprised that I used it at all. As for my whereabouts, that's easy. Look up here in the corner of the doorway! Here I am. Look, I'm waving!

(Charlotte is waving. Up to the class whether Charlotte is to be a person or a marionette with the voice offstage.)

Charlotte: See me now?

Wilbur: (Jumping with excitement) Oh, yes indeed. Yes indeed! How are you? Good morning! Salutations! Very pleased to meet you. What is your name, please? May I have your name?

Charlotte: My name if Charlotte.

Wilbur: Charlotte what?

Charlotte: Charlotte A. Cavatica. But just call me Charlotte.

Wilbur: I think you're beautiful.

Charlotte: Well, I am pretty. There's no denying that. Almost all spiders are rather nice-looking. I'm not as flashy as some, but I'll do. I wish I could see you, Wilbur, as clearly as you can see me.

Wilbur: Why can't you. I'm right here.

Charlotte: Yes, but I'm near-sighted. I've always been dreadfully near-sighted. It's good in some ways, not so good in others. Watch me wrap up this fly.

(Web jiggles as Charlotte moves to wrap up fly. Wilbur watches in horror.)

Charlotte: First, I dive at him (panting with effort). Next, I wrap him up. There! Now I knock him out, so he'll be more comfortable. He can't feel a thing now. He'll make a perfect breakfast for me.

Wilbur: You mean you eat flies?

Charlotte: Certainly. Flies, bugs, grasshoppers, choice beetles, moths, butterflies, tasty cockroaches, gnats, midges, daddy longlegs, centipedes. mosquitoes, crickets - anything that is careless enough to get caught in my web. I have to live, don't I?

Wilbur: Why, yes of course. (Gulping) Do they taste good?

Charlotte: Delicious. Of course, I don't really eat them. I drink them—drink their blood. I love blood.

Wilbur: (fainting) Don't say that. Please don't say things like that!

Charlotte: Why not? It's true, I am not entirely happy about my diet of flies and bugs, but it's the way I'm made.

Flies in sties and flies in eyes
Oh flies are food for me.
I eat them up, their blood I sup
I lick it hungrily.

My web I spin to lure them in
I'm as clever as can be.
I make it sticky, nice and icky
To catch them securely.

Wilbur: But it's so cruel!

Charlotte: Well, you can't talk. You have your meals brought to you in a pail. Nobody feeds me. I have to get my own living. I live by my wits. I have to be sharp and clever, lest I go hungry. I have to think things out, catch what I can, take what comes. And it just so happens, my friend, that what comes is flies and insects and bugs. And furthermore, do you realize that if I didn't catch bugs and eat them, bugs would increase and multiply and get so numerous that they'd destroy the earth, wipe out everything?

Wilbur: Really? I wouldn't want that to happen. Perhaps your web is a good thing after all.

Charlotte: Well, Wilbur, it's been lovely chatting with you, but really, I must have my breakfast. So, if you will excuse me.

Wilbur: (Bowing his head, unable to look up) Oh, oh sure. I should have my morning nap any way. See you soon.

(Wilbur turns and goes to his pile of hay, shaking his head, trying to let it all sink in. Goose, who has been listening to the whole conversation now speaks in an aside to the audience.)

Goose: There are a lot of things Wilbur doesn't know about life. He's really a very innocent little pig. He doesn't even know what's going to happen to him around Christmas time; he has no idea that Mr. Zuckerman and Lurvy are plotting to kill him. Poor Wilbur. Poor innocent little Wilbur.

SETTING: Lights fade, end of Scene 1.

SCENE 2

SETTING: Some weeks later. It is morning. All the animals are sleeping at first, then the goose begins to move around on her nest.

Goose: Oh, oh my, oh wonderful-onderful, finally-inally. (some amusing wiggling on the nest)

Charlotte: (lowering herself down for a better look) I am sure that every one of us here will be gratified to learn that after four weeks of unremitting effort and patience on the part of our friend the goose, she now has something to show for it. The goslings have arrived. May I offer my sincere congratulations.

Goose: Thank you, thank you, thank you. (bowing graciously)

Gander: Thank you. (strutting, handing out ears of corn like cigars to all the other animals)

Wilbur: Congratulations! How many goslings are there? I can see only one.

Goose: (Getting off nest for all to see; goslings can be puppets, dolls or children) There are seven.

Charlotte: Fine! Seven is a lucky number.

Goose: Luck had nothing to do with this. It was good management and hard work.

Templeton: (creeping sneakily closer for a better look) Look, you say you have seven goslings. There were eight eggs. What happened to the other egg? Why didn't it hatch?

Goose: It's a dud I guess.

Templeton: What are you going to do with it? (coming closer, greedily watching)

Goose: You can have it. Roll it away and add it to that nasty collection of yours.

Gander: Certainly-ertainly-ertainly you may have the egg. But I'll tell you one thing, Templeton, if I ever catch you poking-oking-oking your ugly nose around our goslings, I'll give you the worst pounding a rat ever took. (Gander rises to full height. beats wings moving Templeton back from the nest.)

(Goose, using her bill, pushes the egg out of the nest toward the rat who, chuckling with glee, rolls the egg under the trough as all watch.)

Wilbur: Imagine wanting a junky old rotten egg!

Charlotte: A rat is a rat. But, my friends, if that ancient egg ever breaks, this barn will be untenable.

Wilbur: What's that mean?

Charlotte: It means nobody will be able to live here on account of the smell. A rotten egg is a regular stink bomb.

Templeton: I won't break it. I know that I'm doing. I handle stuff like this all the time.

Templeton sings a little song as he goes:

I know I am a rat-o
There's nothing wrong with that-o
I fear only the cat-o
That wretched tom-cat brat-o.

(As Templeton goes under the trough with the egg, Lurvy comes in with Wilbur's slops. Wilbur hungrily goes to slurp up slops, Lurvy notices the new goslings.)

Lurvy: Well, hello there! Let's see . . . one, two, three, four, five, six, seven. Seven baby geese. Now isn't that lovely! (Goose is preening, showing off.) Wait till I tell Mr. Zuckerman. (Lurvy exits, giving Wilbur an affectionate pat.) Eat up, boy!

(Old sheep enters)

Sheep: Hello! Seems to me you're putting on weight.

Wilbur: Yes, I guess I am. At my age it's a good idea to keep gaining.

Sheep: Just the same, I don't envy you. You know why they're fattening you up, don't you?

Wilbur: No.

Sheep: Well, I don't like to spread bad news, but they're fattening you up because they're going to kill you, that's why.

Wilbur: (hysterically squealing) They're going to what?

Sheep: Kill you. Turn you into smoked bacon and ham. Almost all young pigs get murdered by the farmer as soon as the real cold weather sets in. There's a regular conspiracy around here to kill you at Christmas time. Everybody is in the plot—Lurvy, Zuckerman, even John Arable.

Wilbur: (sobbing) Mr. Arable? Fern's father?

Sheep: Certainly. When a pig is to be butchered, everybody helps. I'm an old sheep and I see the same thing, same old business, year after year. Arable arrives with his .22, shoots the . . .

Wilbur: Stop! I don't want to die! Save me, somebody! Save me!

Charlotte: Be quiet, Wilbur!

Wilbur: (screaming) I can't be quiet. I don't want to be killed. I don't want to die. Is it true what the old sheep says, Charlotte? Is it true they are going to kill me when the cold weather comes?

Charlotte: Well, the old sheep has been around this barn a long time. She has seen many a spring pig come and go. If she says they plan to kill you, I'm sure it's true. It's also the dirtiest trick I ever heard of. What people don't think of.

Wilbur: I don't want to die. I want to stay alive, right here in my comfortable home with all my friends. I want to breathe the beautiful air and lie in the beautiful sun.

Sheep: You're certainly making a beautiful noise! (Old sheep exits, shaking his head in disgust at the scene.)

Wilbur: I don't want to die!

Charlotte: You shall not die.

Wilbur: What? Really? (standing with sudden hope) Who's going to save me?

Charlotte: I am.

Wilbur: But how?

Charlotte: That remains to be seen. But I am going to save you, and I want you to quiet down immediately. You're carrying on in a childish way. Stop your crying! I can't stand hysterics.

Wilbur: But, Charlotte, how can you save me? Clever and beautiful as you are, you're only a spider. You can't stop them if they want to kill me.

Charlotte: I'll make sure that they won't want to kill you. People are very gullible. I'll make sure you become indispensable.

Wilbur: (suddenly depressed, sings a moving song) Oh Charlotte, I don't see how you can make me (stuttering) indi, indi, absolutely necessary.

What am I going to do?
Who can I turn to?
I don't want to be a stew,
Woe is me!

Charlotte: (a little annoyed but understanding his plight) Wilbur! Don't you trust me? I'm your best friend, I've taught you all you know about life. I am absolutely positive that this time next year, you will be here breathing the beautiful air and lying in the beautiful sun. Depend on it.

Wilbur: Really, Charlotte?

Charlotte: Charlotte sings:

My magic I will weave,
Wilbur, please don't grieve
I'll save you, do believe
Depend on me.

Wilbur sings his mourning song, Charlotte sings her song, so it becomes a duet.

Wilbur: You are my best friend, Charlotte, I do want to believe you.

Other animals quietly take up the melody of Charlotte's song, singing

Her magic, she will weave
Wilbur, please don't grieve
She'll save you, do believe
Depend on her.

Charlotte: (as other animals sing) Don't worry. Your life is secure, believe it.

Wilbur: (suddenly sleepy, exhausted by the emotional trauma) I do believe you, Charlotte. I know you will think of something wonderful and magical. I am no longer afraid now that I know you will help me.

Charlotte: (softly) Good. Sleep now, Wilbur. It is important to my plan that you keep strong and healthy sleep easy my friend.

Wilbur: (mumbling, half asleep) Thank you, Charlotte.

Charlotte does a reprise of her lullaby:

I'm right here above your head
So you can hear everything I've said
Now close your eyes and go to bed
Sleep in peace.

THE END

BACKGROUND LITERATURE

Barbe, W. B. & Joseph S. Renzulli, (Eds.) (1975). *Psychology and Education of the Gifted*. New York: Irvington.

Cushenbery, D. C. & Howell, H. H. (1974). *Reading and the gifted child: A guide for teachers*. Springfield, IL: Charles C. Thomas.

Durr, W. K., Jean M. LePere, & Hayek-Brown, R. (1976). *Teacher's Guide for Passports*. Boston Houghton Mifflin.

Gowan, J. C., Khatena, J., & Torrance, E. P. (Eds.) (1979). *Educating the Ablest: A Book of Readings on the Education of Gifted Children*. F.E. Peacock.

Reasoner, C. F. (1975). *When Children Read*. New York: Dell.

Witty, P. A. (Ed.) (1971). *Reading for the Gifted and the Creative Student*. Newark, DE: International Reading Association, Inc.

Town of Halliston: The school system's reading continuum outline and objectives.

Class Notes.

FOLK TALES

PROJECT SAGE

OVERVIEW

The best types of literature for young children reveal something important about life and communicate esteemed values that have been handed down from past generations. The simple plot and predictable ending of the folktale appeal to children because they are reassured when things turn out right.

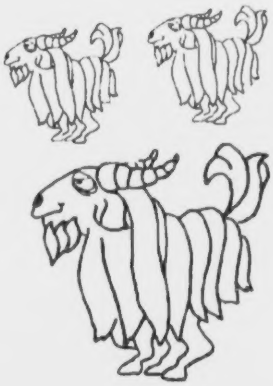
Folktales have three distinctive elements:

1. the introduction that introduces the reader to the leading characters, sets the time and place for the story and introduces the problem or conflict.
2. the development or action that mounts steadily until it reaches a climax, when the problem or conflict will be resolved one way or another.
3. the conclusion that usually follows directly after the climax, and ends everything that was started in the climax.

Materials needed for Art Center projects:

pencils
paste
scissors
valuable junk
crayons
paper
clay
paint
glue
materia

LESSON 1



Students will read*The Three Bears, The Three Billy Goats Gruff* and *The Three Pigs* to learn about *seriation*. Children will develop a folktale arranging three events and three characters in sequence and increasing size. As a result of this activity, children will have become familiar with the arrangement of three items in a series.

Teacher Directions:

1. Show filmstrips and listen to tape recordings of folktales which will familiarize the children with sequence.
2. Read story books, giving children another form of media.
3. Have wordless picture books available to stimulate oral expression.
4. Have sequence games and puzzles available for reinforcement.

Topics for Discussion:

1. The number of characters
2. The physical aspects of the characters
3. The differences in the voices of the characters
4. The order of events
5. How each character dealt with the event

Language Arts Center:

1. Using pictures from the picture file, have children arrange a folktale in the correct order.

2. Have children create their own folktale by arranging pictures in a different sequence.
3. The older children may write their own folktale.
4. The younger children can dictate their folktale to the teacher.
5. Have children tape-record their folktales so that they can hear the voice changes they make for each character.
6. Have children make character clue cards using three clues.
7. Have the children play a Pantomime Game. Put the folktale titles on slips of paper and have a child choose one slip. The child decides which of the three characters he or she would like to act out.

Art Center:

1. Have children create three characters, varying their sizes. Use any form of media.
2. Have children imagine what those three characters might look like. Be unusual. Show them by a painting or drawing.
3. Design some felt characters for the flannel board.
4. Make your own picture book illustrating your folktale.

Evaluation:

1. Have children choose the most creative sequential folktale.
2. Have children tell which child used the most imagination in designing the three characters.

LESSON 2

Cumulative folktales such as, *This is the House that Jack Built, One Fine Day* and the *Gingerbread Boy*, are especially appealing to young children, because those folktales repeat each event from the beginning. Children will take a familiar cumulative tale and plot the trail of events. As a result of this activity, children will have become familiar with the order of events, and how that order can be repetitive.

Teacher Directions:

1. Show filmstrips and listen to tape recordings of folktales that are repetitious.
2. Read story books, giving children another form of media.
3. Have wordless picture books available.
4. Have an assortment of prints or collected pictures available.

Topics for Discussion:

1. Are these folktales easier to remember? If so, why?
2. How do we meet each character?
3. Describe the patterns of repetition throughout each event.

Language Arts Center:

1. With your partner, choose a folktale and list the order of events.
2. From your list, try to design a map showing the route the characters took to get to their destination.
3. Story-Starter Game:

   The leader begins to tell a story, stopping at an exciting part. The next child continues the story until stopping again at another exciting event. While the children are playing, the teacher could tape the tale.

4. Create a group story, and write it on an experience chart.

5. Arrange pictures within the picture file in a different order and determine new stories to develop.

Art Center:

1. Plot the trail of events, by drawing on a long roll of paper.

2. After writing new repetitious tales, design your own scenes to plot what events take place.

3. Make a group collage about the group story.

4. Create a diorama depicting a scene or event.

Evaluation:

1. Have children choose the most creative tale and map.

2. Have children choose the most creative diorama.

LESSON 3

The happy endings of the folktales are satisfying and comforting for young children. Many of the tales reassure the child, because good always overcomes evil. Also, the child's moral development is subtly influenced because virtue pays off. Children will choose a familiar folktale, and create a new ending. As a result of this activity, children will become familiar with plot collection. Also, the children will be familiar with problem solving.

Teacher Directions:

1. Show filmstrips and listen to tape-recordings of folktales, which will familiarize the children with the traditional endings.
2. Read story books, but stop before the end, so children are motivated to finish them.

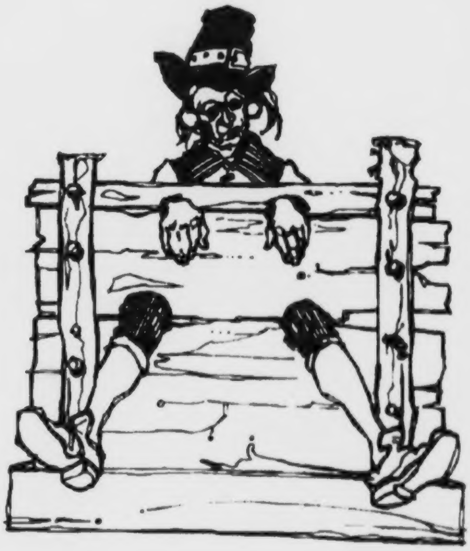
Topics for Discussion:

1. After reading a folktale, ask the children as a group, how else could the story end. Encourage the children to use their problem solving abilities.
2. Discuss possible endings for other folktales .

Language Arts:

1. Make up problem cards to encourage the children to form solutions. Example: Tell how Jack might have escaped the giant, if the beanstalk had not been there.
2. Have the children create their own problem cards.
3. Choose your own ending. Dictate to the teacher, or write the ending.
4. Tape-record your ending with a partner, sharing your stories.

5. Create lists of punishments for the villains, and happy endings for the heros/heroine.



Art Center:

1. Illustrate your ending by making a book.
2. Illustrate your ending by drawing a picture. Compare your picture with those of other students who have chosen the same folktale.
3. Form small groups comprised of those students who have chosen the same folktale. Make a group collage that depicts the new endings.
4. If you have created a new character for the ending, then design your character using valuable junk.
5. Cooking

   If *Hansel and Gretel* was your choice, you might want to create your own gingerbread house.

Evaluation:

1. Have a writing contest. Allow the students to vote on their favorite ending for a particular folktale.
2. Have a drawing contest. Allow the students to vote on their favorite picture-form of a folktale ending.

LESSON 4

Folktales encourage children to dream and fantasize about the world. Children will assume the roll of their favorite character, and tell how it feels to be this character. As a result of this activity, children will have become more familiar with character portrayal.

Teacher Directions:

1. Familiarize the children with the different kinds of characters.

Topics for Discussion:

1. After reading a folktale, encourage the children to retell the story as though they were one of the characters. Example:

   Cinderella-main character

   Step sister

   Fairy godmother

2. What would it be like to be a good character or, an evil character?

Language Arts:

1. Have the child tell the tale, acting as his or her favorite character. As they tell their story, record it on a cassette recorder. Put the stories into a book after they have been typed. This will be a terrific way to share the tales, and you can add the book to your class library.

2. Become your favorite character and write an autobiography.

3. Create a scene for your chosen character, then present it to the class.

4. How is the character you chose, like or different from yourself? Develop a list.

5. Game - This game was used in Lesson 1. To change the game to fit this lesson, write the name of a character on a slip of paper. After the child chooses a slip of paper that contains a character's name, he or she will act like that character and the other students will try to guess who that character is.

Art Center:

1. From the list below, choose a way to depict your favorite character:

   -puppet

   -portrait

   -clay sculpture

2. Design a costume for your favorite character.

3. Illustrate the tale you have created for your character.

4. Create a felt board character that could be used.

5. Design a mobile that represents your character.

Evaluation:

1. Have children choose the best character autobiography.

2. Have children choose the most creative puppet, sculpture and portrait.

LESSON 5

The folktales have been altered through the ages as a result of oral transmission. One familiar tale is the story of the *Gingerbread Boy*. *The Pancake* is a version taken from the Norse tales. *The Bun* is a version taken from the Russian tales. *The Wee Bannock* is a version taken from the Scottish tales. Children will create their own version of the *Gingerbread Boy*. As a result of this activity, children will become more familiar with parallel plot construction.

Teacher Directions:

1. Read several versions of the *Gingerbread Boy* to the children on successive days.

Topics for Discussion:

1. Initiate informal discussion after each story version.
2. Discuss similarities and differences.
3. Discuss which version the children liked best and why.

Language Arts Center:

1. Have the class decide what the runaway will be and create a group story. As the children dictate, write it on an experience chart.
2. Develop your own version of the *Gingerbread Boy*, by making

   the runaway a ______. Or choose one from the list below:

   -frisbee
   - newspaper
   -flying saucer
   - hamburger
   - piece of fruit
   - fish

   Record each story so the children can share.
3. Become your runaway. Tell how it feels to be a frisbee.

How would you get away? What would be your destination?

Art Center:

1. Create a class mural that depicts the group story.
2. Illustrate your version of the *Gingerbread Boy*. Compare your illustrations to those illustrated by other students.
3. Using miscellaneous art media, design your runaway.
4. Cooking

Have the children choose the most creative version of the *Gingerbread Boy* and the most creative runaway.

LESSON 6

Storytelling is a pleasant activity, which exposes children to a wealth of literature they might not otherwise encounter. Children will take the role of a storyteller, and present their favorite folktale. As a result of this activity, children will become more confident in the art of storytelling.

Teacher Directions:

1. Be a model for the children by learning and telling the stories.
2. Encourage the children to begin telling their own stories.
3. Invite a storyteller to your classroom.

Topics for Discussion:

1. How to choose a folktale.
2. Preparing the tale.
3. What makes a good storyteller?

Language Arts Center:

1. Have show-and-tell days to encourage spontaneous oral expression.
2. Use wordless, picture books to stimulate storytelling.

   Share a book with the class, asking questions and drawing comments from the group. The children can then create a group story.

   Have the children tell their individual stories into a tape-recorder. The tapes can be added to the listening station for sharing.

   Have the children tell their story to the class.

3. Have the children create different voices for the characters in their folktale.

4. After the children have become familiar enough with their folktale, have them create their own way of telling it.

Evaluation:

1. Have the children choose the most creative storyteller.

LESSON 7

Presenting a play is one way to encourage the children to combine their talents as a group. Children will create their own version of a folktale, and develop it into a play. As a result of this activity, children will become familiar with all the aspects of creating a play.

Teacher Directions:

1. Be a resource person for the class.
2. Invite one of the many children's theater companies to perform at your school.
3. Take the class to see a play or movie of a folktale.

Topics for Discussion:

1. Initiate informal discussion after the performance of the theater group.
2. Choosing which folktale to present
3. Organizing the class into small groups to work on such group interests as script writing, scenery, costumes, music.
4. Writing the play
5. Choosing the children for the parts in the play
6. Preparing the play

   Invite resource people from the community to help the class with developing their play.
7. Rehearsing the play
8. Presenting the play

Language Arts Center:

1. Have children create the scenery.
2. Have children design the costumes.
3. Have children design posters to display at various locations in the school.

Music:

1. Have children create some new and unusual songs for the play. After the play has been sufficiently rehearsed, present it to the school. Then invite the parents for an evening performance.

Evaluation:

1. Have the class evaluate their production.
2. The audience will be the other source of evaluation.

SPECIAL MATERIALS

- ☐ a folktale library that includes the books of teachers, students, and the public library.
- ☐ a picture file that illustrates the folktales (This will be used to stimulate many language and art activities.)
- ☐ large posters that depict a folktale. (Use to decorate folktale center.)
- ☐ puppets which represent characters from the folktales
- ☐ story props to aid the child in creativity, while the child develops a story
- ☐ games which have been described in the lessons
- ☐ tape-recorder
- ☐ filmstrips and cassette recordings

COMMUNITY RESOURCES

☐ High School Drama Center
☐ High School Home Economics teacher, students
☐ High School art students
☐ Elementary music teacher
☐ Gerwick Puppets. 256 Main St., Franklin, Mass., 02038 (will provide workshops on making puppets).
☐ New England Theatre Guide, c/o Marilyn Levine, 27 Ellis Ave. Whitman, Mass.
☐ O'Connor, E. Storyteller. *Tales Around the World*. 871-1954
☐ Larry Johnson. Illustrator; *Boston Globe* (no charge)
☐ Kathleen Dudash. In-school resource for theater, stage design, prop building, stage costuming, make-up.
☐ Farmingham, Mass: Wing Press Printers

LITERATURE SAMPLER

PROJECT SAGE

OVERVIEW

The Literature Sampler is an adaptation of the *Junior Edition Literature Sampler* which attempts to introduce the student to various types of literature. It is composed of excerpts from various books that provide skills training to help students obtain the most from literature and to choose appropriate reading material.

OBJECTIVES

The Literature Sampler will:

- ☐ Introduce the student to different types of literature.
- ☐ Stimulate students' interest in various types of literature and increase their understanding of this literature.
- ☐ Acquaint the student with authors' styles.
- ☐ Introduce students to literary devices such as personification, puns, situation comedy, fantasy, allegory, symbolism, onomatopoeia.
- ☐ Introduce students to plot, conflict, setting, characterization, point of view and theme.
- ☐ Have students write critiques and/or book reviews.
- ☐ Develop critical reading skills.
- ☐ Develop questioning and interpretation of stories and concepts to pursue independently.

PROCEDURES

1. Administer "Preview" which serves as a pretest to assess prior knowledge.
2. Begin lessons from *Literary Skills* (McDonald Publishing) see references— *Reading Comprehension and Skills through Literature Series.* Begin by differentiating between non-fiction and fiction, identifying the elements of each.
3. Once the skills have been introduced, use various examples from classroom resources to exemplify various literary skills.
4. Proceed to Literature Sampler. Students can have the opportunity to sample literature, by reading short excerpts from book previews in the sampler.

NOTE : The use of the Literature Sampler can be substituted by samples of short story, biography or novel, from the school library or classroom collection if you are unable to purchase the sampler.

5. After students have read book previews, the teacher can divide books into categories suggested in the teacher's guide of the sampler, or use the suggested sheets enclosed which organize samples into such topics as: mystery, adventure, drama.

6. Once the preview is read, students are then better able to decide if the book would be of interest, and search it out in a library to read in its entirety.

7. The teacher can then build upon skills previously taught from Literary Skills sheets by applying them to the theme or topic being pursued. Example: If using the sampler to introduce the novel or biography, the skills in the worksheets can be taught in conjunction with the reading or the writing of a novel, short story, or biography. Or, a type of non-fiction can be read as a follow-up to the skills taught.

8. Use of Reading Aids in Sampler:

   The reading aids in the sampler develop the following:

   a. finding the main idea
   b. noting details
   c. sequencing
   d. making comparisons
   e. drawing inferences
   f. drawing conclusions
   g. predicting outcomes
   h. cause/effect
   i. evaluating content
   j. recognizing literary devices.

9. Portions of *Creative and Practical Writing* (McDonald Publishing) can be used in conjunction with reading aids to develop preceding skills.

   The following skill sheets are suggested for use:

   Information Please

Pick and Choose

Character Sketch

Figurative Language

Speaking Figuratively

Writing With Style

The following sheets can be matched with some of the skill sheets in Literary Skills:

a. 3 Setting
b. 3a Setting
c. 4 Characterization
d. 4a Characterization
e. 4b Tone and Mood
f. 5T Plot
g. 5a Plot
h. 2C Literary Skills

When using these sheets, mix and match them before the students read the material and then refer to the sheets during the students' reading of the literature. This serves as a relevant and meaningful reinforcement of skills.

10. Administer "Preview" as a post-test and also "Summarizing All I Have Learned" from *Creative and Practical Writing*.

11. Children should be able to write critiques, book reviews, or give some type of product/project to share with the group after each topic or theme studied.

    Use skill sheets from *Creative and Practical Writing* to build upon writing skills. Each skill sheet should precede assignments as needed. Suggested sheets include:

    a. 7T - Writing Creatively
    b. 7a - 4 Steps to a Story
    c. 8T - Observation
    d. 8a - Observation
    e. 8b - Observe and Report

f. 9T - Eyes and Ears to Describe

g. 9a - Seeing and Hearing

h. 1OT - More Good Senses

i. 10a - Tasting, Smelling and Touching

j. 11T - Vivid Details

k. 11b - Getting Into Focus

EVALUATION

The "Preview" can and should be administered again for a comparison evaluation along with "Review of Literary Skills" (12B) from *Reading Comprehension and Skills.*

MATERIALS AND REFERENCES

1. *Literary Skills - Reading Comprehension and Skills through Literature Series.* McDonald Publishing. Available from:

   Resources for the Gifted
   3421 1. 44th Street
   Phoenix, Arizona 85018

2. *Creative and Practical Writing*

   Creative and Fundamental Writing Skills Series, McDonald Publishing. Available from: Resources for the Gifted

3. The Literature Sampler, Junior Edition

   Learning Research Associates, Inc.
   1501 Broadway
   New York, N.Y. 10036

HEROES AND HEROINES

Read books that follow:

1. #13 "Young Abe Lincoln" from Abraham Lincoln: *The Prairie Years*
2. #23 "Fight For Freedom" from *Narrative of the Life of Frederick Douglass*
3. #50 "The Joyful Dancer" from *Dancing Star*
4. #56 "The Price of Liberty" from *Haym Salomon*
5. #59 Missionary Doctor from *Albert Schweitzer*
6. #60 Paris At Last from *Madame Curie*

After reading these previews, hypothesize your own definition of a hero or heroine, then answer the following questions:

1. Name some people you consider to be heroes/heroines and tell why you feel they are.
2. Are heroes/heroines born as such? How do they get to be known?
3. Should heroes/heroines be perfect? Why or why not?
4. Do you think you will ever be a hero/heroine? Why or why not?
5. Why do people have heroes/heroines? Do you think this is good?
6. If you could pattern yourself after a hero/heroine, whom would you choose?
7. Which of the six people you read about do you think is the greatest? Tell why.

Choose your person carefully and locate the book from which this excerpt was taken. Read the entire book. When you have finished, write a review of the book. Tell why you think this person is truly a hero/heroine.

STRANGE WORLDS

Read these five book previews and learn about worlds that are more unusual than ours.

1. #87 "The World Behind the Wardrobe" from *The Lion, the Witch and the Wardrobe*
2. #54 "The Little People" from *The Borrowers*
3. #95 "The Land of the Minnipins" from *The Gammage Cup*
4. #98 "In the Camp of the Trolls" from *The Hobbit*
5. #99 "The S-p-e-l-l-i-n-g B-e-e and Humbug" from *The Phantom Tollbooth*

The worlds you have entered are magical and full of fantasy, yet they seem so real if you let yourself become part of the story. Think about the difference between fantasy and fiction. Can you define and explain both? Now, choose one of the books to read in its entirety. Enjoy the story!

Notice the types of descriptive words (adjectives) the author used to tell about vivid details. Did the author use any figures of speech to make the story more exciting or unusual?

Choose one of the characters from your book. Write two short stories about this character. One story should be pure fantasy and the other fiction, but realistic. How will the adjectives or figures of speech change? To go along with your stories, illustrate with a cartoon or comic strip, the main theme or plot (story-line) of your story. Will your readers be able to tell tho difference between fantasy and fiction? Sometimes you'll need to choose your words carefully to show the difference between fantasy and fiction.

MYSTERY, MYSTERY, MYSTERY

Read the following selections:

1. #101 "Under the Black Flag" from *Pirate's Promise*
2. #103 "A Bit of Police Work" from *The Three Policemen*
3. #104 "Detective on the Trail" from *Bill Bergson, Master Detective*
4. #106 "Cry in the Night" from *The Secret Garden*
5. #108 "House of Mystery" from *Three Stuffed Owls*
6. #110 "Clue In the Graveyard" from *Spiderweb for Two*
7. #114 "Sherlock Takes the Case" from *A Study in Scarlet*
8. #115 "Mystery of the Rusty Key" from *The Horse Without a Head*
9. #116 "Pirate Plot" from *Treasure Island*
10. #120 "The Castaways" from *The Mysterious Island*

From these selections, choose one book you would like to read in its entirety. Or, if you know another book you've been dying to read, then the fun be begins!

Read about half the mystery, then close your book. Write the title of the book and the author's name, then end the story. Solve the mystery the way you think it should be solved. Also, illustrate it if you would like.

Now finish reading the book and answer the following questions:

Was your conclusion similar to that of the author's? Explain the similarities and/or differences.

Which ending do you think is more clever? Why?

Which ending was more of a surprise?

LITERATURE
A Taste of Fine Reading

Preview: Assessing Our Information

1. What is literature?

   ____

   ____

2. Define:

   a. plot ______________________________________

   b. setting ___________________________________

   c. theme ____________________________________

   d. point of view ______________________________

   e. conflict __________________________________

3. Match these literary terms to the meanings.

   ______ a. pun

   ______ b. personification

   ______ c. fantasy

   ______ d. symbolism

   ______ e. onomatopoeia

   ______ f. allegory

   1. Practice of representing things or giving meaning to objects, events, or relationships.
   2. Literary of dramatic fiction, using make-believe or imagined characters and setting.
   3. Play on words.
   4. Inanimate objects being given human qualities.
   5. Words that are spelled to sound like the object that the word defines.
   6. Literary or pictorial representation that illustrates a deeper underlying meaning than the obvious plot.

Name ______________________________

REVIEW OF LITERARY SKILLS

1. Literature is divided into what two main divisions? ____________________
2. Fiction that tells a story about a real person, but may use imaginary experiences to portray that person, is called ______________________________.
3. How do novels and short stories differ? ____________________
4. Name a character from a tall tale. ____________________
5. Why do you enjoy reading about this character? ____________________
6. When you try to persuade the reader, you are using what kind of writing? ______ ______________________________
7. Why do we read fiction books? ____________________
8. What is the difference between an explanatory and an aesthetic myth? ______ ______________________________
9. Who is an important character in a melodrama? ____________________
10. What is expository writing? ____________________
11. Fiction that uses real settings but imaginary characters is ____________________.
12. Who is the most famous writer of fables? ____________________
13. Name one well-known writer of short stories. ____________________
14. Why are costumes an important part of plays? ____________________
15. What is the difference between a biography and an autobiography? ____________
16. How do fables differ from other short stories? ____________________
17. Name one type of non-fiction writing. ____________________
18. Fiction related to real-life situations is ____________________.
19. Non-fiction writing is divided into what two categories? ____________________
20. Fiction that uses a combination of real and imaginary events is ______________.

Answer Sheet

1. Fiction and non-fiction
2. Biographical
3. In a short story one incident is the focal point and characters are not finely drawn.
4. Answers will vary.
5. Answers will vary.
6. Argumentative.
7. For pleasure, adventure, excitement
8. Aesthetic myths entertain. Explanatory myths answer questions about nature.
9. Villain
10. It presents facts, tells how to do something.
11. Historical
12. Aesop
13. Answers will vary.
14. Answers will vary.
15. Biography is about another person. Autobiography is about the author's life.
16. They have a moral.
17. Encyclopedia, magazines, newspapers, etc.
18. Realistic
19. Exposition and argument
20. Fanciful

TEST - LITERARY SKILLS

Directions: Place the letter of the correct definition before the word.

_____ 1. biography

_____ 2. non-fiction

_____ 3. drama

_____ 4. plot

_____ 5. autobiography

_____ 6. myths

_____ 7. fable

_____ 8. short story

_____ 9. fiction

_____ 10. tall tale

A. A story in which the author uses his imagination

B. The plan of a story

C. Writing based on fact and true situations

D. Stories that entertain but also explain natural phenomena

E. Highly imaginative stories which use exaggeration

F. Stories that teach a moral

G. A brief form of fiction

H. A story performed on stage

I. A story of a person's life written by someone else

J. A story about a person's own life

THE NEWSPAPER

PROJECT SAGE

PREREQUISITE

To present this unit in its entirety, the following materials are recommended for purchase from Interact Company and Resources for the Gifted:

-newscast	-interact
-newskit	-resources for the gifted

Interact Co.
P.O. Box 9610
Phoenix, AZ 92040

Resources for the Gifted
3421 N. 44th St.
Phoenix, AZ 85018

OVERVIEW

As part of a news team, students can assume responsibilities and be provided with opportunities to exercise their creativity, while at the same time, become independent, critical consumers of news.

This unit contains:

Motivating Students (introductory activities)

Your Local Newspaper as Mentors
Tic-Tac-Toe with the News
The "Bias Detection Kit"
Newton Daily News - Newspaper Analysis
Survival Skill - Reading a Newspaper
Evaluating Local Newspapers

All About the Newspaper

Headlines
Heading the News
Hard News or Feature Story?
Hard News Stories - The 5 W's and H
Feature News
Editorials/Letters to the Editor
Editorial Cartoons
Debating
Informative Interviews
Super Sports Stories
Advertising

Captions
Newspaper Fillers
News Jargon

Organizing your own Paper

Who's Who?
What's the Focus
Schedule It!
Copy Envelope Organization
Oops! A Mistake!
Lay It All Out
Printing Options

OBJECTIVES

- ☐ Students will distinguish the difference between a hard news story and a feature story.
- ☐ Students will incorporate the basics (accuracy, spelling, capitalization, punctuation, clarity, language, good taste and proofreading) in developing their own style of writing.
- ☐ Students will develop effective interview techniques.
- ☐ Students will distinguish between fact and opinion in news.
- ☐ Students will investigate various newspaper printing options.
- ☐ Students will seek out people's opinions on various topics by conducting surveys and polls.
- ☐ Students will recognize the difference between news and entertainment.
- ☐ Students will evaluate local news in a critical manner.
- ☐ Students will develop an intelligent plan of using news that will serve primarily to inform, and secondarily, to entertain.
- ☐ Students will understand the various forces that tend to distort, shape, overstate or underplay various news events.
- ☐ Students will become intelligent, critical consumers of news.
- ☐ Students will compose their own editorials (statements of opinions) after collecting facts on the subject, before forming an opinion and providing suggestions for correcting the situation or solving the problem.
- ☐ Students will create headlines that convey the mood of the article and entice the reader to focus his or her attention to the article.
- ☐ Students will research very important persons who began their writing careers as reporters in order to discover how a journalist works.

- ☐ Students will become aware of current events and famous people in the news.
- ☐ Students will determine newsworthy events that would be appropriate to include in a newspaper.
- ☐ Students will investigate the many careers, available in journalism:
    - publisher
    - editor
    - editorial editor
    - news editor
    - features editor
    - reporters
    - columnists
    - cartoonists
    - advertising manager
    - sales
    - art layout
    - classified
- ☐ Students will organize a newspaper of their own.
    - Focus of the newspaper
    - Purpose of the newspaper
    - Scheduling assignments
        1. Feature stories
        2. Hard news stories
        3. Editorials
        4. Cartoons
        5. Sports
        6. Reviews
        7. Fillers
        8. Advertising
        9. Photographs
    - Layout of newspaper
    - Editing
    - Printing
- ☐ Students will become familiar with newspaper jargon.
- ☐ Students will understand the various forces that tend to distort, shape, overstate or underplay various news events.

☐ Students will learn how to utilize the newspaper in order to make decisions.

☐ Students will learn to organize their thoughts and ideas. They will learn to express their opinions, clearly and rationally.

☐ Students will learn to support their opinions logically.

SPECIAL NOTE: The complete Newspaper activity is available on a regular check-out basis from the Project Sage office.

ALL ABOUT THE NEWSPAPER—Technicalities

Hard News or Feature Story

What is the difference? How can you easily tell the difference?

Hard News: A story that tells the facts. These facts are the five W's: who, what, where, when, why (and sometimes how).

Feature Story: A writer takes the facts and uses them to create an interesting, often exciting story.

Two typical styles are:

THE PYRAMID

Uses
the facts
to build the
story to a well
written conclusion

THE INVERTED PYRAMID

Begins with the ending
of the story and
explains to the
reader how it
all happened

Read the following articles. Decide which article represents a "feature story," and which article represents a "hard news" story.

I felt curious and a little bit afraid as I gazed at the small, white box I had just found. What could be in it? I was walking home from school when I saw it sitting there. There was no name on it. I looked up and down Elm and Green Street. There was no one around. Slowly, I lifted the lid. There was a $100.00 bill inside! I wondered if I should keep it. I decided to write about what happened and send it to the newspaper. Maybe I'd be lucky and no one would claim the box.

____

On Tuesday, October 11, a box was found on the corner of Elm and Green Streets. The box was white and measured 6" x 4" x 3". Since there was no name on the box, I kept it.

____

Try your hand at creating your own hard news and feature story. Choose a small object, such as a coin to use as the theme of your story.

Object Selected: ______

Hard News Story: ______

Feature Story: ______

HARD NEWS HAVE

5 W's and H

Rudyard Kipling, working as a newspaper reporter, wrote:

> I keep six honest serving men,
> They taught me all I knew.
> Their names are WHAT and WHY
> and WHEN
> And HOW and WHERE and WHO.

Hard news stories are found on the news pages of any newspaper. In the news story below, identify the 5 W's and H:

Who	**What**
When	**Where**
Why	**How**

Try writing your own hard news stories. Choose from the events in the classroom, at home, a happening on a trip, in a store, or the play yard. All the facts must be true. Save your creative writing for feature stories.

FEATURE NEWS

Newspapers often have special feature columns or sections, such as the ones listed below. Pretend that you have just been given a job as a feature writer. Which of the following columns would you like to write? Mark your first, second and third choice with a 1, 2, 3.

____Gardening

____Movie Reviews

____Science Facts

____Political Cartoons

____Crossword Puzzles

____Local History

____Horoscope

____Outdoor Life (Camping)

____Stock Market Analysis

____Advice on Bridge

____Clothing Fashions

____Advice to Consumers

____Personal Advice

____Business Trends

____Humor

____Editorials

____Furniture Refinishing

____Games and Activities for Children

____Famous People

____Mathematic Puzzles

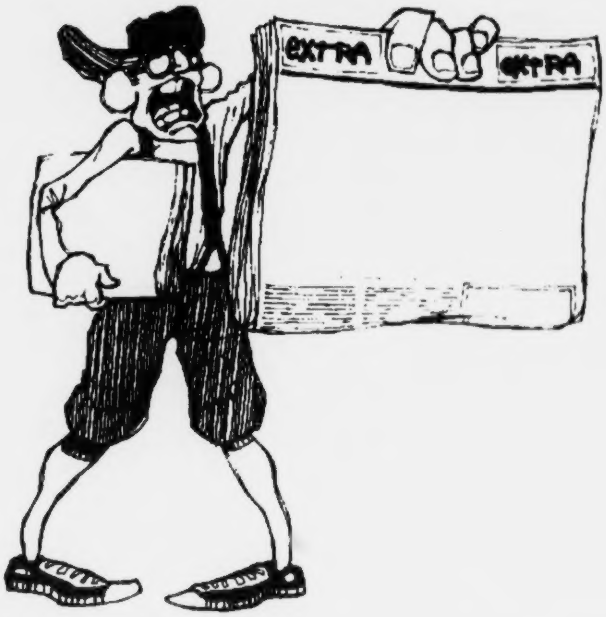
____Advice on Chess

____Book Reviews

____Travel

____Pet Care

HEADLINES



Headlines often determine whether an article gets read or is passed by unnoticed. Look over a page in your local newspaper. Notice that all articles are headlined, and the sizes and type of print vary.

The larger type is meant to catch your eye. What the type says is meant to catch your interest and let you know what is in the article.

Headline writing poses two problems for the writer: 1) telling what the article is about, 2) fitting it into the spaces allowed for headlining. A headline must also convey the mood of a story. A tragedy would not have a humorous headline!

Each headline is given a number of spaces, depending on the width of a column of print. Each letter requires a certain amount of space, punctuation marks take space and spaces between words use up a space.

Have students read the following articles and create attention-getting headlines. In some cases, a specific number of spaces have been provided for in the headline. Students might need to try eliminating words, finding shorter synonyms or rearranging words. Have students assume each letter requires one space and each punctuation mark, a half space.

EDITORIALS: Letters to the Editor

The newspaper prints opinions of news events and issues in the Editorial section. The articles appearing there are called editorials. Because they are statements of opinion, editorials differ from many of the news stories that are based on fact. Usually included in the Editorials section are letters to the editor. These are letters that are sent to the newspaper by its readers. The letters are about news issues or editorials that were printed in an earlier edition of the newspaper. It is very important to have the facts on a subject before forming an opinion and writing about it in editorial form.

Before writing your own editorial:

1. Study the proper steps in presenting a debate.
2. Select a topic for discussion and decide the position you will support.
3. Familiarize yourself with the pros and cons and research the topic thoroughly.
4. Organize your materials and thoughts in the proper debating style.
5. After you have thoroughly researched and prepared for the debate, the debate should be given in front of a panel of judges.
6. Try to videotape your debate and play it back to evaluate the process.
7. Incorporate your skills of debating when writing an editorial. Select a subject on which you have a strong feeling and write a persuasive editorial about it.

EDITORIAL CARTOONS

An editorial cartoon differs from comic strips and other cartoons in this important way: it states an opinion—this may be positive (for), or negative (against). The editorial cartoon expresses your feelings on a given subject (topic) such as politics, school, cafeteria food, athletics, gum chewing—you name it!

Create your own editorial cartoon.

1. First, decide on a topic of interest to you.
2. Make pencil sketches.
3. Draw your cartoon on white paper, approximate size 4" X 4".
4. Use a thin, black pen for the final drawing.
5. Are words needed? Try to be as brief as possible.

PREPARING TO DEBATE

I. What is a debate?

date assigned

date due

II. A lecture on debating will be given. Please listen carefully and take notes on the information presented. It will be helpful for you to organize your notes in outline form. You may use the following skeleton outline. It is by no means complete. It is simply a guide to aid you. You may add to it or omit from it.

date assigned

date due

A. What a debate is.

B. Types of debating

C. Organization of a debate

1. Structure of propositions.
2. Propositions of fact
3. Propositions of policy
4. Analysis
5. Points of issue
6. Evidence
7. The issues - affirmative and negative
8. Rebuttal

D. Presentation procedure

III. Resolved: The President of the United States should be elected for one term of six years and should be ineligible for re-election.

We will use the above resolution for planning a debate. This debate will be planned for all of us as a group. We will use our outlines as guides.

date assigned

date due

IV. Think of at least two topics which you feel would be suitable for debating and phrase them in proper debate language below. You may use any books or periodicals for topics. Be sure you choose a subject on which you can find authoritative materials. Authoritative materials would be books, periodicals and experts in the field.

We will discuss your resolutions, and the class will choose one for planning a debate.

date assigned

date due

V. Using the resolution which was selected from part IV of the assignment, do the following:

A. Work out the points of issue which you feel are appropriate.

B. Gather the evidence which is pertinent to the subject.

C. Work up the issues—either affirmative or negative depending upon our previous decision.

D. Work up the rebuttal.

When you have completed your planning, I will go over your plans with you individually in preparation for your final, full-scale debate.

date assigned

date due

IV. Using what we have learned about debate and some of the resolutions which we have formed, each of us will plan and participate in a debate.

Be sure to use the procedures outlined and discussed previously.

date assigned

date due

DEBATING

I. What a Debate is

A. Debate is a series of formal spoken arguments in favor of or opposed to a specific proposal.

B. A debate is different from a discussion in that a discussion is the means by which a problem is recognized and solutions or answers are explored.

C. Debate is the means by which the best solution is approved or accepted. Therefore, discussion begins with a problem; debate begins with a proposed solution to a problem.

D. An example of discussion might be "What is wrong with our study habits?" If a discussion were held concerning this problem, and a decision was reached stating that our study habits were poor because of a lack of adequate materials, then a debate could be held. To select the best solution to the problem of poor study habits, a resolution would be formed. For example, Resolved, adequate materials should be supplied for school students to aid in better study habits.

II. Types of Debating

A. The formal debate has the same number of speakers on each side (affirmative and negative).

B. Each speaker has the opportunity to reply directly to opposing members.

C. Affirmative and negative speakers usually alternate.

D. All speeches are limited in time.

E. In informal and legislative debating, the speakers also have the opportunity of responding to the opposition.

F. There is, however, no time limit. We witness this type of debate in Congress.

G. Also, in informal or legislative debating, there is not necessarily any alternation between opposing speakers nor does there necessarily have to be the same number of speakers per side.

III. Organization of a Debate

A. Structure of propositions - Subjects for debating are phrased in the form of propositions. A proposition is a carefully worded statement which makes clear the positions of both the affirmative and negative sides.

B. Propositions should be:

1. within the knowledge, experience, understanding and interest of the debaters as well as the audience.
2. debatable, that is, it should not be obvious: true or false.
3. an honest difference of opinion with good arguments and evidence on both sides.
4. worded affirmatively or positively. Example: Resolved, that John Jones did a good job as president of the student council. Not Resolved, that John Jones did not do a good job as president of student council.
5. contained in only one idea. This limits the debating to only one subject at a time.
6. worded clearly. The words used should be definable to prevent the debate from becoming a quibble over word meanings.
7. worded in such a way that one does not prejudge them to be true. The reason for debate is to prove the resolution true or false.

C. Propositions of fact:

1. Try to answer the question "Should we change?"
2. Example: Resolved, Juries should be abolished in criminal trials.

IV. Analysis

The next step is the analyzing of the proposition by both sides:

A. Analysis begins with a good understanding of the subject.

B. Each team member should know as much about his opponents' side as he knows about his own.

C. Good debaters:

1. Study the beginning and background of a proposition.

2. Define words and terms.

3. Survey the arguments and evidence for and against a proposition.

D. Debaters must decide which arguments are pertinent (related and should be included).

E. The arguments are narrowed down to points on which the affirmative says yes and the negative says no. This is called "finding the points of issue."

V. Points of Issue

A. The main points of difference between the affirmative and the negative are the main issues of the points of issue.

B. These can then be divided into subordinate points of issue.

C. There must be a clash of opinion on the main points of issue as well the subordinate points of issue.

D. A good way to help find the issues is to list the opposing arguments in parallel columns.

VI. The Evidence (After the points of issue have been decided)

A. Debaters find the evidence which will prove the issue true or false.

B. Evidence can be in one of two forms:

1. Facts—actual happenings or things that can be proved.

2. Opinions are an interpretation of facts and evaluation of other persons' views. Only opinions of experts in the field may be used in debate.

VII. Rebuttal is the preparation to answer the arguments and evidence of the opposing team.

A. The debaters on each team must choose from their opponents' arguments and evidence—that which can be successfully attacked.

B. Then they must plan their own arguments and evidence and attack these points.

VIII. Presentation Procedure

We will be using the traditional form of debate with two or three members on each team. Each speaker makes a constructive speech and a rebuttal speech. If we have two members per team, the order would be:

A. Constructive speeches (eight minutes)

   1. First affirmative
   2. First negative
   3. Second affirmative
   4. Second negative

B. Rebuttal speeches (four minutes)

   1. First negative
   2. First affirmative
   3. Second negative
   4. Second affirmative

SUGGESTED DEBATE TOPICS

- Thomas Jefferson contributed more to American democracy than George Washington.
- The early explorers were more courageous than explorers of today. The voting age should be lowered to 18.
- The California Gold Rush did more good than harm.
- Automation is more helpful than harmful.
- Electricity has contributed more to industry than petroleum.
- Boxing should be outlawed.
- Thomas Gainsborough contributed more to the field of art (painting) than Joshua Reynolds.
- The Electoral College should be abolished.
- Capital punishment should be abolished.

DEBATE EVALUATION SHEET

Using the following check list, evaluate the debaters for each of the criterion listed below by placing a number from 1 to 5 that represents the ability of the debaters (see key) beside each item.

Constructive Speeches

PRESENTATION:

_____ Voice
_____ Eye level
_____ Posture
_____ Length of speech
_____ Convincing manner
_____ TOTAL POINTS

CONTENT:

_____ Valuable information
_____ Proof of points
_____ Reliable sources
_____ Bibliography
_____ Recap
_____ TOTAL POINTS

Rebuttal Speeches

PRESENTATION:

_____ Voice
_____ Eye level
_____ Posture
_____ Length of speech
_____ Convincing manner
_____ TOTAL POINTS

CONTENT:

_____ Valuable information
_____ Proof or disproof of points
_____ Reliable reasoning
_____ Information based on authoritative source

_____ TOTAL POINTS

KEY

1 Fair
2 Good
3 Better
4 Best
5 Very Best

GRAND TOTALS

_____ Constructive Speeches

_____ Rebuttal Speech

_____ Constructive Speeches & Rebuttal Speech

INFORMATIVE INTERVIEWS

Reporters gain much of their story information by conducting interviews with people involved in a newsworthy situation. In this section, students will learn how to conduct informative interviews to gain information for their hard news story assignments.

1. Students will select a reporter job that is of interest to them:

    National Reporter
    Science Reporter
    Sports Reporter
    On-the-Road Reporter
    Education Reporter
    Justice Reporter
    Human Interest Reporter
    Music Reporter
    Business Reporter
    Comment Reporter
    International Reporter

2. As one of the reporters listed above, students will be given a hypothetical assignment to cover and, a key figure related to the story to interview. Background information will also be supplied, so students can come to understand their responsibilities as an interviewer.

3. Not only will students assume the role of interviewer, they will also role-play an interviewee for another reporter. For example, if one student is the National Reporter, he or she can play the interviewee role for the Science Reporter. The Science Reporter, in turn, can play the role as the interviewee for the National Reporter. The classroom teacher should assist interviewee roles after reporter jobs have been selected. Therefore, in this activity, each student will play two roles:

    a. a reporter, conducting an interview, and

    b. an interviewee. Interviewees will be supplied with background information, so they can assume a certain personality while performing as the interviewee.

4. After students have conducted an interview and have been interviewed, more information for their story will be gathered by using the newsroom files contained in the kit. The newsroom files contain interviews, press briefing, and business reports. Students must look carefully through the files to locate information related to their stories. Students should take notes on facts they might want to use in their stories.

5. Students should write their stories, referring to notes, taken during interviews and on newsroom file materials. Students must apply their knowledge of how to write hard news stories in their articles.

6. Articles can be shared in a class newspaper.

ORGANIZING YOUR OWN PAPER

Who Does What?

Post a newspaper job sign-up.

PUBLISHER
Student: ____________________

EDITOR
Student: ____________________

EDITORIAL EDITOR
Student: ____________________

NEWS EDITOR
Student: ____________________

REPORTER(S)
Student: ____________________

FEATURE EDITOR
Student: ____________________

COLUMNISTS
Student: ____________________

CARTOONISTS
Student: ____________________

ADVERTISING MANAGER
Student: ____________________

SALES
Student: ____________________

ART LAYOUT
Student: ____________________

CLASSIFIED
Student: ____________________

PUBLISHER	Selects editor; assumes financial responsibility for publishing and distributing newspaper; sets policies of paper.
EDITOR	Chooses department editors; coordinates all sections of the paper in seeing that material agrees with policies set by the publisher; proofreads and edits articles; plans space and lay out design; writes headlines for articles.

BEST COPY AVAILABLE

WHAT'S THE FOCUS?

Consider the focus of the newspaper before you decide on an appropriate name for it.

- Who will be reading it?
- Who will be writing it?
- What ages?
- Will it be a . . .

NEWSpaper?
SPORTSpaper?
FUTURISTICpaper?
FANTASYpaper?
PUZZLEpaper?

Or will your paper combine all kinds of stories, drawings, photos, opinions and more?

Have a contest to decide upon

- the focus of the paper,
- the name of the paper, and
- the logo design.

Schedule It

Schedule assignments for reporters. The editors and news staff should meet and decide on a selection of newsworthy events that would be appropriate to include in your newspaper. Reporters should then be given assignments. It helps if they are given topics that interest them and ones they are qualified to handle.

Reporters should understand that news reporting often requires a lot of "leg work." They must be prepared to check facts to be sure they are accurate and to avoid stating their own opinion.

People who are involved in the story should be interviewed. It is usually best to ask for interviews after getting background information on the subject to be discussed.

Once the information is collected, it must be analyzed carefully for consistency, appropriateness and accuracy. The material must be carefully evaluated to be sure it meets with the editorial policies of publisher and standards of good taste.

Once assignments have been made, set a reasonable deadline time for the completed articles to be ready for print. Allow enough time for all the background and follow-up work to be done.

SCHEDULE IT!

Worthy News

News Story # 1 ____________________

News Story # 2 ____________________

News Story # 3 ____________________

News Story # 4 ____________________

News Story # 5 ____________________

News Story # 6 ____________________

News Story # 7 ____________________

News Story # 8 ____________________

News Story # 9 ____________________

News Story #10 ____________________

	Assigned To:	**Deadline**
# 1	____________________	__________
# 2	____________________	__________
# 3	____________________	__________
# 4	____________________	__________
# 5	____________________	__________
# 6	____________________	__________
# 7	____________________	__________
# 8	____________________	__________
# 9	____________________	__________
#10	____________________	__________

Copy Envelope Organization

When most of your stories are typed, cut them out and organize them in categories as listed below.

You can then easily see the areas that lack enough material.

- envelopes
- hard news
- features
- editorials
- photos
- comics
- classified ads
- display ads
- fillers
- cooking, hobbies & other columns

Your Writing Purpose

1. To Entertain:
   - Use words that add color and emotional detail.
   - Avoid difficult words.
   - Do not include many facts, dates, times, names.
   - Try to write in a humorous, clever way.
   - Write to answer the questions, what and where...not how and why.
2. To Inform:
   - Do not take sides, save those opinions for writing editorials.
   - Write to answer the questions, what, where, when, why, and how.
3. To Instruct:
   - Use key words to give the article a step-by-step feeling: (first, second and third).
   - Include words that relate to the particular skill (pattern, stitch) about which you are writing.
   - Focus on those facts that tell how to accomplish the skill.
   - Try to add some humor, if possible.
   - Write to answer the question, how.
4. To Persuade:
   - Use strong language words that show conviction!
   - Use words that are "charged with emotion!"
   - Use witty or clever phrases where possible.
   - Present your own viewpoint and/or criticisms. You may "take sides." Write to answer the questions how and why.

Look through your local newspaper for articles that would fit into each of the categories mentioned above.

Were all the points listed under the descriptions of each type of article included in the ones you selected?

Did you notice anything that you would add to the descriptions?

Oops, A Mistake!

As a copy editor, some marks of correction need to be developed. Commonly used symbols are supplied below. Have the students change or add to these marks.

cap	capital letter needed or used unnecessarily
sp	mistake in spelling
p	mistake in punctuation
¶	new paragraph needed
no ¶	new paragraph not needed
mar	faulty margin
syl	syllabication (word incorrectly divided)
ill	illegible handwriting
F	fragment (not a complete sentence)
⊃	run-on sentence
VOC	vocabulary (poor word choice)
abb	incorrect abbreviation
K	clumsy or awkward construction
?	not clear
∧	something omitted
u	faulty usage (illiterate expression)
gr	faulty grammar
t	wrong tense of the verb

After you have had an opportunity to write your own articles, copy writers should scrutinize articles and make corrections, using the universal symbols developed.

Lay It All Out

Editors should meet together and determine the layout of the newspaper.

- What will appear on each page?
- What will the format be?
- Where will each section appear?
- How will each section be numbered?
- Where will each picture be placed?
- How will fillers be used?

Many decisions will have to be made. Editors will have to come to an agreement on how the layout will look in its final form.

Use the newspaper layout sheet that follows. Make a paste-up sheet for each page.

Newspaper Layout Sample

Page No. ________ Day ______________________________ Date ____________________

Printing Options

The final method of producing your paper will influence the various ways of putting it all together.

Suggested Methods

- Photo-copy by machine - 2 sides
- Off-set printing process (Many high schools offer this service.)
- Professionally typeset and printed
- *Ditto runoff
- *Mimeograph printing

To have the closest thing to actual, newspaper-making experiences, do not use these methods of printing. It is difficult to do paste-ups, small drawings, effective borders and lettering with these two methods.

Processes For Photo-copy by Machine and Off-set Printing Process

1. When stories are written and proofread for errors:

   Type in 2½" columns on 20 lb. ditto paper. Use single spacing. (Do not use erasable bond or newsprint papers!) Correct errors with Liquid Paper. Cut out stories carefully, and organize in envelopes. (See envelope organization page.)

2. Drawings must be done with black markers.

3. Cut-outs from magazines make attractive additions. Any dark color will print well.

4. Layout:

   "What you see is what you get!" If there are smudges or unnecessary lines or pencil mistakes, these will print! Clean up any extra glue, too. Plan each page. What goes where? Lay it all out! If your stories are 2 1/2" wide, you will have a 3 column paper for final pages that measure 11" x 14". See drawing. Leave one-inch margins on top, bottom and sides of each page and about 1/2" margins between columns. Check to see that each page has a variety of size of stories with some artwork and/or photos for eye appeal.

5. Paste-up:

   You can buy paste-up boards or use graph paper. (Light blue guidelines will not print and can help keep your stories straight!) Paste on one side of the paper only! Use rubber cement or Gluestick. Remember, clean copy produces a clean newspaper!

6. Photos - Vellox process

Process for Professional Typeset

1. Type all stories doubled-spaced on regular typing paper. Indicate size of type desired and column width. A typesetter will explain all things available and specific terms for them.
2. Drawings must be done with black markers.
3. Photographs will be processed so that they will print.
4. When pages are typeset, stories are cut into columns.
5. Then follow layout procedure as for methods 1 and 2. Backs may be waxed so that glue is not needed.
6. Be sure that all pasting is done perfectly straight. Use a brayer to smooth out each page.
7. Again, what you see is what you get! Check to see there are no smudges or extra pencil lines.
8. The printer then takes photographs of each page. The negatives are used to print your final newspaper.

Process for Ditto Machine

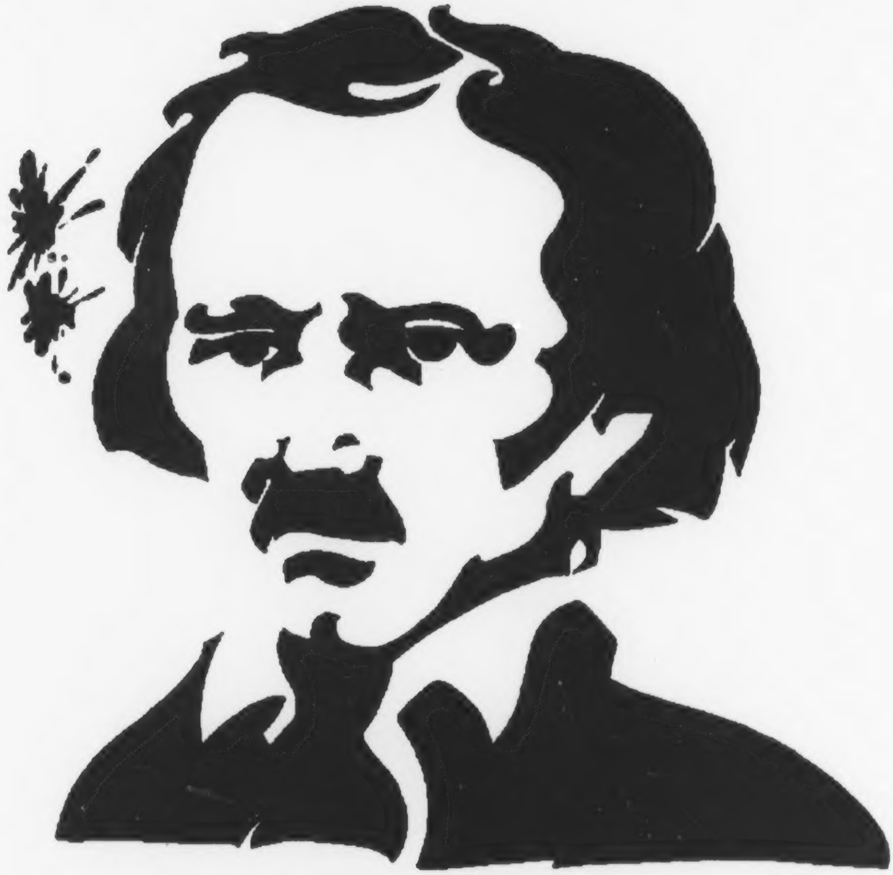
1. Typing must be done directly onto a ditto master.
2. Plan what goes where. Allow margins and space for drawing in borders and headlines.
3. Only one side of the paper can be used in this process.
4. Thin lines, placed close together, will appear to darken an area.

Process for Mimeograph Machine

Similar to the ditto machine with these exceptions:

1. The ditto will produce a newspaper with purple print and illustrations. The mimeo will make it black.
2. It is possible to print on two sides of a piece of paper on the mimeo, but only on one side of the ditto.
3. Use a stylus for drawing and borders.

EDGAR ALLEN POE



PROJECT SAGE

OVERVIEW

This unit will concentrate on the short stories of Edgar Allen Poe and the characteristics of his short stories. In the study of Poe's work, students will compare and analyze his short stories. Students will also become familiar with the rising actions, climax and falling action and the use of these terms.

OBJECTIVES

Students will:

☐ Listen to Poe's short stories:

The Fall of the House of Usher

The Tell Tale Heart

The Murders in the Rue Morgue

The Pit and the Pendulum

The Cask of Amontillado

The Masque of the Red Death

☐ Discuss the stories.
☐ Compare the works of Edgar Allen Poe.
☐ Become familiar with the format of a short story.
☐ Understand rising actions, climax and fall action.
☐ Create a short mystery story to contribute to a class terror magazine.

READINGS

THE FALL OF THE HOUSE OF USHER

Discussion Questions:

1. Why does Roderick Usher invite the narrator to his house?
2. Do you think Roderick buried Madeline intentionally or unintentionally? Support your answer by providing clues given in the story.
3. What type of illness did Roderick Usher have? Did his illness have any affect upon his painting and music?
4. Make a comparison of the appearance of the exterior of Usher's house with Roderick Usher's mind. How is the outside of the house like his mind?
5. How does the narrator explain the events in this tale? Is he able to deal with them? Explain.

Activities:

1. Use your imagination to depict the House of Usher.
2. In a sequence of pictures (cartoons), illustrate the physical breakdown of Roderick Usher.
3. Investigate one of the mental disorders that Roderick seems to have. Present an oral report to your class.
4. Create a courtroom scene skit where Roderick Usher tries to defend himself against the charge of buying his sister, Madeline.
5. What would the sequel of this tale be like? Write your original tale.
6. Design a gravestone with an epitaph for Roderick Usher.

7. Which is more interesting - the narrator, the house or Roderick Usher? Make your decision and explain your choice in an essay.
8. Criticize Poe's use of the poem *The Haunted Palace* for symbolism by writing a letter to Poe, telling him your opinion.

THE TELL TALE HEART

Discussion Questions:

1. Is the narrator's reason for killing the old man a logical one?
2. After listening to the narrator defend himself, the detectives did not leave. Why did they stay?
3. Why do you think the narrator finally confessed?
4. Who is the tell tale in this story?
5. How long did it take the narrator to kill the old man?

Activities:

1. Write a short skit, dramatizing the scene from this tale in which the narrator is speaking to the detectives.
2. Probe the question, "What is your subconscious?" Teach a lesson about your findings.
3. Write a poem entitled *The Tell Tale Heart* which follows the plot of this tale.
4. Predict the detectives' reactions to the narrator's decisions. Write an official report to be submitted to the detectives' superior.
5. Investigate Poe's biography. Decide which events or factors might have led to his choice of topics. Make a filmstrip.

THE MURDERS IN THE RUE MORGUE

Discussion Questions:

1. Define *"analytic faculty."* Why does Poe begin this story by discussing the analytic faculty used in whist but not in chess?
2. Dupin displays his own analytic powers in the tale twice. Tell about each.
3. After reading the newspaper account of the murders, list the unusual things about the murders.
4. What motive can be eliminated for the murders and why?
5. Poe is often referred to as a "madman who writes about insanity." Does he display this trait in *The Murders in the Rue Morgue*? Explain.

Activities:

1. Read Sherlock Holmes' mystery and construct a flow chart, showing Holmes' use of analytic faculty.
2. After playing a game of bridge (or watching a game of bridge played), make a report which tells how analytic faculty is used.
3. Investigate the topic of "mind-reading" and put together an annotated bibliography on the subject.
4. Rewrite the tale by changing the ending to the story.
5. Write a television news report that would inform the public about Dupin and his solving of the murders.
6. Judge this tale on the merits of a good vs. poor mystery. Choose a side. Hold a debate.

THE PIT AND THE PENDULUM

Discussion Questions:

1. What is the Spanish Inquisition?
2. The first third of the story takes place in the dark. How does the narrator misjudge the size of the dungeon?
3. What physical harm comes to the narrator?
4. Poe goes to great length to describe the narrator as he awaits the swing of the pendulum. Why?
5. The narrator suffers through the tale. Is his suffering, mental or physical? What caused his suffering?

Activities:

1. On a large mural, illustrate the dungeon that the narrator was in.
2. Show the importance of sight, by organizing and conducting a blind walk with the class.
3. Analyze the Spanish Inquisition, particularly the years of punishments, and prepare a television news report, telling about your findings .
4. Compare the narrator's mental suffering to his physical suffering.
5. Based on the narrator's mental state, create a game that would take his mind off his troubles.

6 Based on your knowledge of the inquisition, evaluate Poe's writing of the punishment of the narrator in an essay.

7 Pretend you are the defense attorney for the narrator when the judges who had punished him, are themselves put on trial. Deliver your closing statements to the classroom as you criticize their acting.

THE CASK OF AMONTILLADO

Discussion Questions:

1. Why does Montresor want revenge on Fortunato?
2. In your own words, tell how Montresor lured Fortunato to his vaults.
3. This tale is filled with irony. Name at least three examples of irony.
4. How does Fortunato's attitude change, once he begins to realize Montresor's plot?
5. Montresor's obsession for revenge makes him more cunning. How?

Activities:

1. Illustrate this tale in comic strip form.
2. Dramatize Fortunato from the time he is chained by Montresor until he pleads for his life.
3. Survey others who have read this tale to find out if they feel Montresor's actions were justified or not. Write a newspaper story to report your findings.
4. Analyze Montresor's feeling for Fortunato by writing a letter as, perhaps, Montresor did to a close friend, telling him of his plans for Fortunato's death.
5. Organize a debate in which one side defends Montresor's actions because of the injustice he has suffered. The other side should refute this.
6. Revise the ending of this tale to show a more humane side of Montresor.
7. Evaluate the effectiveness of Montresor's choice of punishment for Fortunato in an original poem.

THE MASQUE OF THE RED DEATH

Discussion Questions:

1. What does Prospero do to avoid the plague?
2. What was Prospero's attitude toward the plague?
3. While the plague rages, what does Prospero do to provide entertainment for his friends?
4. How does the decor of the suite in which the ball is held, reflect Prospero's moral life?
5. The seven rooms are talked about at length. Tell about the symbolism of the arrangement of rooms and the decor of the seventh room.
6. What is the symbolism of The Masque of the Red Death as he arrives at the ball?

Activities:

1. In a mural, illustrate the arrangement of the seven rooms.
2. Interpret Poe's words and descriptions of the Red Death and make a puppet in the form of a mask.
3. Compare Poe's tale to another of his tales and make a chart, showing the similarities and differences of the tales.
4. Examine Poe's motives for writing a story that has the Red Death as its theme and write an essay about the subject.
5. Concoct an antidote which will help Prospero ward off the Red Death.
6. Write a TV news report to tell the world about it.
7. Develop a skit in which the Red Death surprises all and does not represent death. Perform the skit for the class.
8. Judge the sanity of the narrator as if you were a doctor attending to Prince Prospero. Write a report of your findings.

Culminating Activities

1. Select two of Edgar Allen Poe's short story selections that you have read. Compare and contrast the two works in an essay.
2. Mimicking Poe's writing style, create your own short story. Contribute your work to a terror magazine, published by you and your classmates.

POETRY

Roses are red,
Violets are blue,
Sugar is sweet,
and so are you.

PROJECT SAGE

OVERVIEW

> . . . It is the imaginative use of knowledge that is essential for actual creative productivity.
> - *Sidney J. Parnes*

By nature, children possess a measure of ability to express wonderment, curiosity, imagination and creativity.

Imagination is an act of forming mental images, pictures of what is not actually present to the senses. It is the ability to see the unseen. Creative imagination is the ability to form unique, novel and original mental images.

In developing creativity, the following processes encourage and reward this kind of intellectual activity:

> Fluent thinking consists of the generation of a quantity of ideas, plans or products. The intent is to build a large store of information or material for selective use at a later time.
>
> Flexible thinking provides for shifts in categories of thought. It involves detours in thinking to include contrasting reasons, differing points of view, alternate plans and various aspects of a situation.
>
> Originality is the production of unusual or unanticipated responses. It is characterized by uniqueness and novelty. Responses may be considered original if they are clever, remote, individualistic uncommon, inventive or creative in nature.
>
> Elaborative thinking is the ability to refine, or enrich an idea, plan or product. It involves the addition of new and necessary details for clear and complete communication. It is an elegant response, an ornamented idea or an expansion upon ideas.
>
> Curiosity is evidenced by inquisitiveness, a strong desire to know about something. It involves the use of all senses to investigate, test out and to conform guesses and hunches about the unfamiliar or unknown.
>
> Willingness to take a calculated risk is activity that involves speculation, prediction, wisdom and foresight. Risk-taking is characterized by will, disposition and desire to set greater goals in anticipation of greater gains. Consideration for the elements of chance, liking the unknown, adventure and a tolerance for insecurity are common traits to the risk taker.

Preference for complexity is a willingness to accept a challenge. Challenges may be in the form of intricate ideas, difficult problems, complex designs or complicated theories.

Intuition involves quick and clear insight.

CREATIVE ACTIVITIES - POETRY

> "Creativity is like a spring of water, issuing from the ground, a nuisance at first because it creates a muddy quagmire. Find a channel for the runoff, then box in the spring. The ground around will become green and grassy."
>
> -John Gowan

Poetry activities help to provide a channel for the rising springs of creativity inherent in all children. The activities in this unit are designed to stimulate the imaginative and creative talents of students, while at the same time, introduce the patterned forms of written or oral expression and allow for the development of such factors in divergent thinking as fluency, flexibility, originality and elaboration.

The activities in this unit will involve students in exploring, questioning, imagining and modifying new ideas as they are created and expressed in verbal and figural form. The unit emphasizes the self-expression of students.

Beginning With Words

- Homonyms
- Antonyms
- Letters
- Permutations
- Synonyms
- Words and Feelings
- Word Play (Illustrated Words)
- Word Placement

Making Word Connections

- Writing Similes
- Personification
- Alliteration
- Metaphors
- Hyperbole
- Onomatopoeia

Poetic Forms

- Haiku
- Cinquain
- Grid Poems
- Tanka
- Verse Forms
- Picture Poetry
- Poetic License
- Dada
- Diamante
- Acrostic Word Poems
- The Limerick
- Stanza Forms
- Tercet
- Narrative Poem

OBJECTIVES

☐ Students will develop the ability to communicate their observations accurately and succinctly.

☐ Students will expand the concept of, and usage of language.

☐ Students will develop fluent, flexible and elaborate thinking.

☐ Students will distinguish the difference between traditional poetry and concrete poetry.

☐ Students will develop an understanding of:

hyperbole
personification
onomatopoeia
alliteration

☐ Students will explore various poetic forms including:

Haiku
Cinquain
Grid Poems
Tanka
Verse Forms
Picture Poetry
Poetic License
Dada
Diamante
Acrostic Word Poems
The Limerick
Stanza Forms
Tercet
Narrative Poetry

☐ Students will understand how words can be linked together to create poetry.

☐ Students will develop the use of imagery when creating similes and metaphors.

☐ Students will express ideational relationships and colorful comparisons.

☐ Students will create an anthology of poems they have written.

CONCRETE

OR

TRADITIONAL POETRY?

The difference between concrete poetry and traditional poetry is seen in the visual expression of verse form.

Concrete poetry is a unique and non-conforming poetic style. Where traditional poetry would take a word such as sun, and then use descriptive lines of verse to express feelings about that word, concrete poetry would place the word, sun, in a visual form that would actually show feeling about the word.

HOMONYMS

Some poets find that the use of *homonyms* adds a special touch to their poems. A homonym is two or more words that have the same sound, but differ in spelling and in meaning. For example: *sale and sail* are homonyms.

Below is a list of words. Supply the homonyms of these words.

Reed ______________________________

Won ______________________________

Road ______________________________

Peel ______________________________

Flour ______________________________

To ______________________________

Ate ______________________________

Meet ______________________________

Bow ______________________________

Grown ______________________________

Pear ______________________________

Gate ______________________________

Write ______________________________

Steal ______________________________

Week ______________________________

New ______________________________

Air ______________________________

Mist ______________________________

Wood ______________________________

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Piece ______________________________

SYNONYMS

Synonyms are words of the same language which have essentially the same meaning.

In many traditional poetic forms, synonyms are used within the poem to describe the title or theme of the poem in a number of ways.

Following are a few synonyms of the word *poet*:

bard
poet
versifier
laureate
rhymer

Use a thesaurus to help you list as many synonyms as you can for the words listed below:

Big ____________________

Tiny ____________________

Hill ____________________

Home ____________________

Symphony ____________________

Sound ____________________

Free ____________________

Raindrop ____________________

Face ____________________

Season ____________________

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WORDS AND FEELINGS

The true poet is attuned to his or her senses. Answer all questions using single words only that display your feelings.

Explain what the word yellow means to you!

__________ __________ __________ __________ __________

How does yellow smell?

__________ __________ __________ __________ __________

What does yellow taste like?

__________ __________ __________ __________ __________

Does red smell?

__________ __________ __________ __________ __________

What does red smell like?

__________ __________ __________ __________ __________

How does red taste?

__________ __________ __________ __________ __________

What does black feel like to you?

__________ __________ __________ __________ __________

What is your favorite color?

__________ __________ __________ __________ __________

What does it taste like?

__________ __________ __________ __________ __________

What does it sound like?

__________ __________ __________ __________ __________

How does it make you feel?

Describe your favorite person in all the world!

What does tenderness mean to you?

Explain fear.

How does love feel?

When do you experience blue feelings?

When do you experience red feelings?

When do you experience green feelings?

ANTONYMS

An *antonym* is a word that suggests a sense opposite to that suggested by another word. For example:

Light - Dark

Large - Small

Examine the list of words below and write opposite words for them.

Beautiful ______________________________

Ocean ______________________________

Smooth ______________________________

Time ______________________________

Easy ______________________________

Good ______________________________

Poor ______________________________

Shut ______________________________

Quickly ______________________________

Stupid ______________________________

Man ______________________________

Danger ______________________________

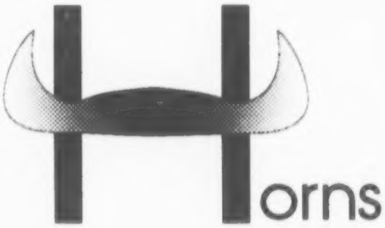
Warm ______________________________

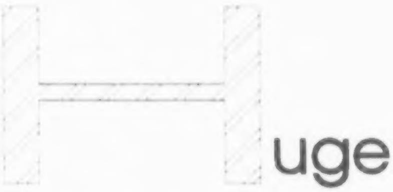
Happiness ______________________________

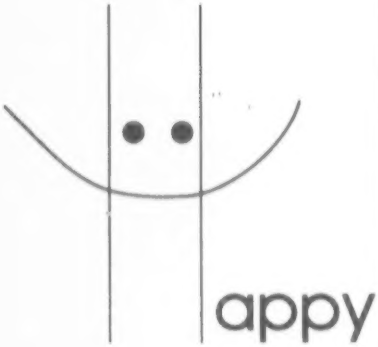
Single ______________________________

LETTERS

The visual design of letters in poetry can have a great deal of influence on its impact. Notice how these drawings of the same first letter in the words below help emphasize the meaning of the word.



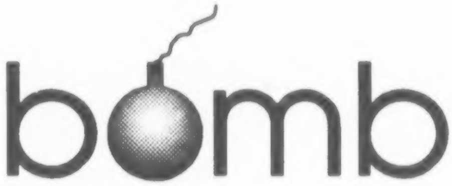




Change each of the words below into a concrete poem by the design of the first letter.

- bicycle
- lemonade
- star
- gigantic
- complex
- frequent
- drive
- win
- turn

Letters within a word can also be designed to have a visual impact on its total meaning.



Try this list for starters, then develop more of your own.

- hot
- mirror
- flat
- drip
- hammer
- bumpy
- cent
- magnify

Using your initials, create a logo that is representative of your personality, your hobbies or interests. Can you change your initials to a concrete representation of yourself?

Beginning With Words

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WORD PLAY

1. Illustrated Words

   Using repetition and placement of a word, you can create a mental image of that word.

   Try some of your own with the following words:

   - balloon
   - music
   - race horse
   - sandwich
   - icicle
   - read
   - anger
   - soccer

2. Poetry Puzzles:

   With some additional maneuvering of a word, you can turn it into yet another poetic form. Trying to guess the poet's meaning can become quite a challenge. By adding visually to the meaning of a word, these poems can become puzzles.

   Try creating some poetry puzzles with the words listed below:

   - fly
   - bounce
   - dive
   - jump
   - swim
   - skate

3. Many words have more than one meaning.

   Select a word that has three or more meanings and create a visual poem, portraying the word's many meanings.

PERMUTATIONS

By changing the order or arrangement of words, you can express related ideas in different ways. That is what permutations are.

- To be me
- Me to be
- Be to me

By changing the order of words, punctuation, letter size or letters within a given word (for example: feel to fell), unusual poems and poems conveying special meanings can be created.

Make a permutation poem with one or both of these phrases:

Spring has sprung

It is never too late.

Or, make up your own phrases!

WORD PLACEMENT

Placement of words can be an essential part of concrete poetry. Intended meanings can readily be seen when words are arranged in a certain way.

A
L
L
S
T
R
U
N
G
O
U
T

Excuse me
while
I
show
my
e
mo
ti
on
s

ALL
N G
I O
D X

Select one of your favorite verses and illustrate it with a picture word. Experiment with placement when writing the verse. Can you give the traditional verse impact, using both placement and picture words? Does it change the original meaning of the verse?

Convey the meaning of these phrases in visual form, utilizing placement:

A watched pot never boils.

I could have danced all night.

Love is all around you.

RHYMING WORDS

Some poets choose to write poems in rhyme, like this one by Judith Viorst:

MOTHER DOESN'T WANT A DOG

Mother doesn't want a dog,
Mother says they smell,
And never sit when you say sit,
Or even when you yell.

And when you come home late at night
And there is ice and snow,
You have to go back out because
The dumb dog has to go!

Read some poems with rhyming words. Try to identify patterns. Does every line rhyme? Every other line?

Make a list of rhyming words and using these words. Try to write your own poems that rhyme.

LANGUAGE ARTS - RHYMES

Children are to listen carefully to each statement. They are to supply (in unison) a color word in the first group of sentences and a number word in the second group that rhymes with the stressed word in each sentence.

1. Purple grass I've never **seen**

   The grass I've seen is mostly ______________________________.
2. One of the things I like to **do**

   Is color the clouds a nice light ______________________________.
3. Mother said, "Come and have a **drink**"

   "I've made some lemonade that's ______________________________.
4. The witch had a **sack** upon her **back**

   It wasn't striped - it was solid ______________________________.

5. I knew two boys, named **Ted** and **Fred**

A funny thing, their hair was ______________________________.

6. Robert was a handsome **fellow**

He wore a shirt that was bright ______________________________.

7. I saw a cat the other **day**.

Its eyes were green, its fur was ______________________________.

8. If you name a color that rhymes with **man**

You won't say blue - you must say ______________________________.

9. I saw a number on the **door**.

The number that I saw was ______________________________.

10. The snakes I counted in the **den**

Were more than six; I counted ______________________________.

11. The number that will rhyme with **line**

Is not fourteen, it must be ______________________________.

12. This number rhymes with **late** and **gate**

There's only one and that is ______________________________.

13. If I say the color is **blue**

The rhyming number must be ______________________________.

14. Making rhymes is always **fun**

To make a rhyme I just say ______________________________.

RHYME AND RHYTHM

Choose a favorite nursery rhyme and draw it with modern characters.

Write an original nursery rhyme and draw it with modern characters.

TONGUE TWISTERS

Test your talent with a tickling tongue twister.

1. Think of a noun.
2. What consonant sound does it begin with?
3. Then make a silly sentence, trying to begin with as many words as you can with that same sound.

Title Ideas

- Ricky Rabbit
- Purple Pickle
- Slippery Slide
- Try some of your own!

SIMILES and METAPHORS

THE UNUSUAL COMPARISONS GAME

The ability to see resemblances and to make picturesque comparisons between two apparently dissimilar objects has long been considered the hallmark of the poet and the writer. A metaphor is an implied comparison, where a word or phrase ordinarily and primarily used to describe one thing is applied to another (e.g., screaming headlines, a lion's ferocious chrysanthemum head). In a simile, the comparison is made explicit by the use of the words *like* and *as* (e.g., her tears flowed like wine, a heart as big as a whale). An imaginative simile not only enriches and illuminates thought, but transforms our way of looking at things.

First, explain what a simile is and give examples of how it is often the only way to communicate certain thoughts and feelings (old as the hills, dark as a hundred midnights down in a cypress swamp). Then give several incomplete similes to the children and ask them to think of several endings for each one. By encouraging the children to write several endings, you avoid the impression that there is one right answer and you encourage the children to go beyond the obvious, trite responses to more unusual ones. Encourage them to think of a number of comparisons, and ask for volunteers to give their best responses. You might write their responses on the blackboard and then join them to form a poem. Refer to the examples of simile poems composed by several fifth grade classes.

Some simile stems you might use are:

- The flowers smelled as sweet as . . .
- An overflowing garbage can looks like . . .
- The old man walked ad slowly as . . .
- Sometimes I am as lonely as . . .
- The sound of rain is like . . .
- A girl without money is like. . . .
- When I think real hard it feels . . .
- In the winter, the trees look like . . .

When a child gives short answers, encourage him or her to add details to communicate the image as vividly as it is seen. Thus, "The small boy was as lonely as a shoe," often becomes, "The small boy was as lonely as an old, discarded shoe."

Variations

(a) Prior to reading a poem or tale to the class, select a vivid simile from the work and ask the children to complete it. Then ask them whether they prefer their own or the poet's similes.

(b) Read the children a myth. Then ask them to complete similes to further illustrate persons and events in the myth.

(c) Have the children draw cartoons or caricatures illustrating similes and metaphors.

(d) Ask the children to write a short description of concrete objects, e.g., a ruler, and then relate each quality listed to something else, such as, hard as a bone, straight as a soldier at attention, smooth as a pebble at the seashore.

Examples of similes by a fifth grade class:

Lonely as...

a math paper in the spelling section
the last raindrop left in a cloud
a football lying in a basketball court
a sun in winter
a school in vacation time
a turtle in its shell
a dog lost in the Grand Canyon
a ghost town in the West
the only character in a book
a TV without any programs

Simile poems by fifth graders:

LONELINESS

I was lonely as the desert;
as a cat, as a bike with no one to ride it;
like an empty envelope, like a piece of bread
    with nothing on it
like the letter "a," or a pin dropping in an
    empty house.
I felt like a dinosaur out in time,
like one snowflake or one hand alone on a watch
like one grain of rice or the moon alone in the sky.

BEST COPY AVAILABLE

LONELINESS

Loneliness is walking in the snow with nobody around,
like an empty playground or doing your homework,
like standing on the sidelines in Yankee Stadium alone.

Loneliness is like you're at camp for the first
time and the whole bunk is somewhere else.

Loneliness is like a bum with an empty bottle of liquor,
like an ant with a stepped-on friend,
like sitting on a radiator with nobody around.

Loneliness is like being all by yourself in a freight station.

It's like a hole in a window, a bandaged finger, a rowboat in
the bay.

Loneliness is a pool without water or no salt on your french
fries.

It's like a birch tree or a camp in the winter.

Loneliness is like glasses without lenses, an empty pencil
holder, or a no-hit day.

SIMILES

Look up and learn the following two words. Write their definitions down.

As ______________________________

Like ______________________________

A *simile* is a figure of speech in which two essentially unlike things are compared. The comparison is made by the use of the words *like* or *as*. For example: As red as a tomato; Pink sands glistened as sequins below the midnight sky; like a streaking bullet.

Write five sentences using *like*. Write five sentences using *as* for comparisons.

1. ______________________________
2. ______________________________
3. ______________________________
4. ______________________________
5. ______________________________
6. ______________________________
7. ______________________________
8. ______________________________
9. ______________________________
10. ______________________________

WRITING SIMILES

Read each sentence carefully and match the endings that go with it.

Do not forget the use of the words *like* or *as* when you write down the comparisons. The first two are done for you.

1. His face was as white ______ (as a sheet) ______.
2. His face was as red ______ (as a beet) ______.
3. He was mad ____________.
4. He was as angry ____________.
5. The galloping horses sounded ____________.
6. He looked ____________.
7. He was wise ____________.
8. He was tight ____________.
9. The bees swarmed ____________.
10. They walked as slow ____________.
11. He was sly ____________.
12. He was stubborn ____________.
13. She was flighty ____________.
14. Like father ____________.
15. Glittering stars ____________.
16. He had a tongue ____________.
17. Like a ____________.
18. The fog rolled in ____________.

as a hatter
as a beet
as a mule
as snails
like sun
bolt of lightning

as a sheet
like a drowned rat
like a cloud
as a fox
like a cloud
like diamonds

like thunder
as an owl
as a drum
as a butterfly
like a viper
as a hornet

METAPHORS

A *metaphor* is a figure of speech in which a term is transferred from one object to another subject by comparison or analogy. Metaphors, or metaphoric speech, is usually figurative. For example: His face was tomato red; his feet were streaking bullets carrying him over the finish line; a ghostly white fog; the roaring fire; the biting wind.

Write ten sentences using metaphors.

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________
8. ____________________
9. ____________________
10. ____________________

HUNTING FOR SIMILES AND METAPHORS

Which of the following sentences contain a simile? Which ones contain a metaphor? Write your answers down after reading each sentence.

1. He was straight as a stick.
2. His face was as bright as a Christmas tree.
3. His mouth was wide, like a small cavern.
4. His eyes were beet red.
5. His eyes looked like two burned holes in a blanket.
6. He ran down the road with feet of wings.
7. She was fast as the wind.
8. He fought like a tiger.
9. She was as fussy as a setting hen.
10. A cloud of dogwood blossoms lighted up the room.
11. He was slow as molasses on a cold morning.
12. Her eyes were black hieroglyphics of thoughts we could not read.
13. He was an old man with a head like a small turnip.
14. She babbled like a brook.
15. He growled like a polar bear.
16. All the world is a stage.
17. Sheets of rain fell all day.
18. Pearls of laughter filled the room.
19. Her storm of protest was nipped in the bud!
20. She was quiet as a mouse.
21. She was as nervous as a cat on a hot tin roof.

22. Her cheeks were rosy apples.
23. Her lips were shaped like a red bow.
24. A billowing cloud of hair flowed around her face.
25. Her eyes gleamed like stars.
26. A dog of doubt gnawed at the bone of his conscience.
27. Her willowy twigs of arms flayed the air.
28. She was as ugly as a mud fence.
29. She was as good as gold.
30. Her face was an accordion of wrinkles.
31. The long, slender fingers of the poplars stretched up to the sky.
32. A tongue of fire curled around the smoldering log.
33. Her hands were soft as babies' cheeks.
34. He was as skinny as a stringbean pole.
35. Her grandmother's voice was a crazy quilt of laughter and shrills.
36. He had a boiling temper.
37. Her smile was as sweet as gumdrops.
38. They performed like petals in a cluster.

MAKING SIMILES INTO METAPHORS

Without the working metaphor, a poet and writer would be lost. A metaphor, whether in writing or speaking, makes reading and listening easier and more interesting.

The use of metaphors helps us remember things better.

Metaphors are usually more colorful. For example: "His face was tomato red!" will be remembered longer, and make a deeper impression on us than if we heard someone say, "His face was red."

We stretch our imaginations when we use metaphors. For example: She sang so sweetly, it sounded birdlike.

Metaphors help us to see things that otherwise we would just think. For example: It's cold enough tonight to frost your nose!

Metaphors help us to share our feelings and thoughts. For example: You're so pretty you're a Texas rose!

Metaphors help us to express our emotions. They say for us, figuratively, what we would never dare to say literally. Here are some examples: She,ted him so much, she turned purple when she saw him. Your tongue is a two-edged sword! You kids are a bunch of animals!

Now do not cheat yourself by looking backwards at the similes and metaphors you have done! Instead, see how well you have learned them by carefully reading and rewriting the following sentences. Take each simile and turn it into a metaphor.

1. He was straight as a stick.
2. His face was as bright as a Christmas tree.
3. His mouth was wide, like a small cavern.
4. His eyes looked like two burned holes in a blanket.
5. She was fast as the wind.
6. He fought like a tiger.
7. She was fussy as a setting hen.
8. He was slow as molasses on a cold morning.
9. He was an old man with a head like a small turnip.

10. She babbled on and on like a brook.

11. He growled like a polar bear.

12. She was quiet as a mouse.

13. She was as nervous as a cat on a hot tin roof.

14. His lips were shaped like a red bow.

15. Her eyes gleamed like stars.

POETIC FORMS

ACROSTIC WORD POEMS

Unicorn
Noble
Courageous
Roaming

Unique
Immortal
Occult
Natural

When writing acrostic word poems, you expand your thoughts about a particular word by using each letter in the word as the first letter in a modifying word. It helps to use a thesaurus in order to employ words with the proper first letter. A crossword puzzle dictionary may also help you find some words.

One variation of the acrostic poem is to imbed the special word inside the descriptive words.

cheerFul
Relationship
kInd
Emotion
truthfulNess
wonDerful
warmneSs
Happy
carIng
suPer

Write some acrostic word poems of your own!

GRID POEMS

Grid poems are lots of fun to try! Here is how it works:

1. Select a word and write it several times on a grid.

   Word: Teacher

   T E A C H E R
   T E A C H E R
   T E A C H E R
   T E A C H E R
   T E A C H E R

2. Develop a word list from the letters on the grid, selecting letters from each line or from the same line:

   each, reach, he, her, teach, the,
   ace, ache, cheer, trace, chart, rat,
   race, eat, etc.

3. Then make ideas from the words:

   Reach her, Reach each, Teach he,
   Reach he, Hear her, Hear he, Hear each,
   Teach, etc.

4. Put the ideas into the grid format to make a statement:

   R H
   E E
   A A
   C R
   H

   EACH EACH

5. Finally, put the ideas on a grid like so:

t	e	a	c	h	e	R
t	E	a	c	h	e	r
t	e	A	c	h	e	r
t	e	a	C	h	e	r
t	e	a	c	H	e	r
t	e	a	c	h	e	r
t	E	A	C	H	e	r

Capitalize letters so they may stand out and send your message.

Use the grid to create meaningful grid poems of your own. Choose a word that has several vowels and a variety of well-used consonants.

DESIGN A DIAMANTE!

You do not have to worry about rhyme or rhythm, but you do have to know the parts of speech.

The formula:

1. One noun
2. Two adjectives
3. Three participles
4. Four related nouns
5. Three participles
6. Two adjectives
7. One noun (opposite of line 1.)

Now, turn the formula into a poem!

Sea Salty Wet
Drowning Swimming Floating
Waves Whitecaps Drifts
Formations Rolling Expanding
Settling Solid Firm
Land

Design a diamante of your own!

CINQUAINS ARE SIMPLY SCINTILLATING!

Cinquain means five lines (French and Spanish). A cinquain verse is a poem in the following form:

Line 1: One word - Title

Line 2: Two words - Describe title

Line 3: Three words - Action words

Line 4: Four words - Express a feeling

Line 5: One word - Synonym for title

Example:

Puppy - Furry Pal

Jumping - Chewing

Frisky - Faithful partner and friend,

Dog

Sometimes cinquains are written by using syllables.

Line 1: 2 syllables - Snowflakes

Line 2: 4 syllables - Soft, delicate

Line 3: 6 syllables - Sparkling, dancing, chasing

Line 4: 8 syllables - How sad I am to see them melt,

Line 5: 2 syllables - White stars.

Try one of your own!

DADA

Dada poems treat a set of words as building blocks to be arranged in various orders to form different ideas.

1. First, you need a set of words. Here are some ways to obtain these words:
    - A. Choose a short poem and cut it out separately. Use the pieces as the word set.
    - B. Choose a quotation or a long sentence from an article. Cut up the words or write them on separate pieces of paper.
    - C. Find a rather long want ad or several short want ads.
    - D. Using a newspaper or magazine, choose six or more headlines.
    - E. As you read an article or story, select words that are interesting. The resulting words should number between 25 and 50.
2. After the word bank has been developed, there are several ways to produce a dada poem.
    - A. Put the words in a container and draw them out, one at a time. As you draw a word, write it on a piece of paper. Keep the words in the order in which you selected them, but begin and end the poem lines as you wish. Add appropriate punctuation.
    - B. Follow the same procedure as in *A* above, keeping the words in the order drawn. However, you may delete words as you wish.
    - C. Put the words from the word set, on a table in front of you. Move the words around until there is a pleasing pattern. Then either copy the product on another paper, or paste the words on paper.
    - D. Follow the procedures (same as in C above), but you may delete and add words as you wish.
    - E. Categorize the words into nouns, verbs, modifiers and select from each category.

Choose the set of directions you like best. The purpose of this type of poetry is to use the words as blocks. Look at the following example and then create your own dada poem.

Word bank: towns, where, kept, life, communities, observers, greeting, air, and, of, when, be, into, predators.

Dada Poem:
Observers greeting
Warn of predators
Be communities
Town of life
Where air floats into the sky

WRITING POEMS

Well, it's that time again. Are you ready? Try just the same! Choose any subject you feel good with, or feel inspired about, and forget everything but the words you use. Write four poems—placing one in each of the squares below— using any pattern we have discussed.

FREE VERSE

It is free of rules. It is verse, another name for poetry. It is free verse, and here is a sample to taste:

people I meet
all
look so different
some are so skinny I can hardly
see where they
begin and end
and
others
are so short and fat
I wonder how they got
where they are at!

Write a free verse poem. Topics: rain, candy, sunshine. Choose one of your own.

NARRATIVE POETRY

"She was impregnable, ancient as the Nile,
and our instincts warned us
We could never cross Her or climb
Her heights."

A *narrative* poem usually contains countless similes and metaphors. There are narratives written and comprised almost entirely of alliteration.

Narrative poems are written about people, places, animals, nature, or whatever happens to inspire the poet. If you write about someone or something you know well, you will write better. So choose a topic, and begin your narrative poem now! Because a poem is meant to be heard as well as read, share your finished work with the class. How you narrate, or deliver, your narration, is important. Good luck!

NARRATIVE POEM

"Mimosa Farm was a realm unto itself,
boasting a creek of its own and Kemp Mill on one side
with Asheboro about thirty miles on the other.

It was first viewed from a riddling buckboard
by strong, stouthearted Papa,
who was barely sixteen,
and strong, stouthearted Mama,
who was not yet fourteen
but pregnant and feeling poorly.

Mama's dowry was a swaybacked grey dobbin.
Papa's opportunity was the buckboard
and owing the earth nothing but himself,
as they arrived on a hazy October morning
to sharecrop,
in lieu of a piddling ramshackle place,
with visions of becoming dirt farmers.

Together they cut and turned their share of the earth,
furrowed it with sweat and long, backbreaking hours of sowing,
While most often as not Mamma was sick
or wringing her hands and weeping,
as Papa walked enough miles to take him to Jericho
pacing the floor with unknowing.

For they were young stems, almost too tender
and fragile to try weathering the uncertainty
of living like that alone."

The poem you have just read is not an excerpt from a novel. It is not considered prose writing. It is a passage from a book length narrative poem.

A narrative poem tells a story, and most often is very descriptive. Sometimes it is exceptionally dramatic. The poet usually writes his or her narrative poem as if he or she has been a spectator, but not a participant, in the events.

Here is another short passage from the same work:

> "Mama said, 'Aunt Tempie's a charcoal angel!'
> Papa told us, 'She's a true daughter of Ham!'
> But Bucky, Junebug and me, we knew,
> She was either Cleopatra or a bulrush kinfolk of Moses
> Who'd been conceived in a mighty pharaoh's tent,
> and grown up frolicking under the godlike sun
> before she'd been sent to us."

Narrative poetry may or may not have dialogue in it. It may or may not rhyme. There are narrative poems that have no punctuation. A narrative poem can be humorous or factual and give an historical accounting of an incident, or be sad, or be simply an exercise of the poet's imagination.

Well, it's that time again! Are you ready? Try just the same. Choose any subject you feel good with, or feel inspired about, and forget everything but the words you use. Write four poems in any pattern we have just seen.

POETIC LICENSE

You may have noticed that some poets use what are called lower case letters and never use punctuation. They arrange words in such a way that one sentence may be comprised of a single word. This is done for effect. It is called *poetic license*. It is also done to place emphasis upon the meaning of the word, or the entire poem. Here is an example:

loneliness
is
a
very
n
a
r
r
o
w
pathway
that
must
be
walked
single
file

Poetry should be written to be seen as well as heard. There is a metaphor in the poem you just read. Did you spot it? Right — loneliness is a narrow path.

the wind buffets
the morning
pulls its strength
through
the sunshine
filters the warmth
pushes
the sand like fog
before it
where leaves collage
the beach
A loosed brown leaf
hobbles
rustling
scratching its way
to the sea
like a giant fiddler
crab returning
to its mother

Poets should be sensitive to the meanings and sounds of their words. They should also be concerned how their work looks to the reader. Every poet has a choice to make: Should the poem look long and thin or short and stocky? Should it be dense or full of air and space? Does it need punctuation, or what kind, and how much? Careful decisions in these matters can do much to enhance the poem's impact upon readers.

Now here is a little poem with emotion and feeling.

November's sadness
hovers
in the chimney
It clouds
the windowpane
It slips in
between
the covers on my bed
It stains the mother earth...

Let's take a good look at that poem. It flows freely. It sets a mood, it paints a picture, creates an atmosphere, presents vivid metaphors and rouses our senses. Wow! All in nine little lines. Line by line, this is what it is saying to the poet who wrote it:

November is sad
Its cold, whistling wind is in the
chimney
Frost is on the windowpane - he can't
see out
Even his bed feels chilly
Frost - or ice, or snow - covers the
ground

Do you see the difference between just setting down facts and creating the facts poetically? Here is the ending to the above poem:

. . . while I leaf watch
as at a wake
dreading the funeral
of winter
the eclipse of time
when darkness comes
and death takes over

The last lines of the poem are saying:

He watches the last leaf fall
To him it is like attending a wake of a
friend to see autumn go
To him winter is like a funeral . .
trees are naked, the world appears
stark and empty
The sun is paled and gives him no warmth
Even the darkness lasts longer
And to him it is a time of dying, or
death

TERCET

one day when i rested by the sea
a lonely old seagull came up to me
and we kept each other company

A group of three lines, whether a complete poem, or a stanza, is called a triplet, or *tercet*. A tercet poem is a triplet of lines that rhyme together or that are connected with adjacent rhymes.

autumn paints the colors in the leaves
until one by one by twos and threes
they hand like ornaments on the trees

On examining these two examples of the tercet form, we see it is a three-line stanza and each of the three lines end in rhyme and have the same rhythm, or beat. Sometimes the rhyme may vary, but nearly always the lines are the same length. Here is another tercet poem.

have you ever sat and tried outstaring
someone who is bold and overbearing?
i'm telling you it's quite outwearing!

As you have seen, a tercet tells a little story with carefully chosen words. In these examples, the poet felt it added to the humor and cuteness he intended to write in lower case letters, even to the *i*.

Here is a real silly tercet.

i bought a three pound goose-egg
from a woman known as Meg
when i was up in Winnipeg

All right, let's get the tercet characteristics all together.

A tercet is a three-line stanza with three lines that rhyme and have the same rhythm. A tercet tells a little story with carefully chosen words.

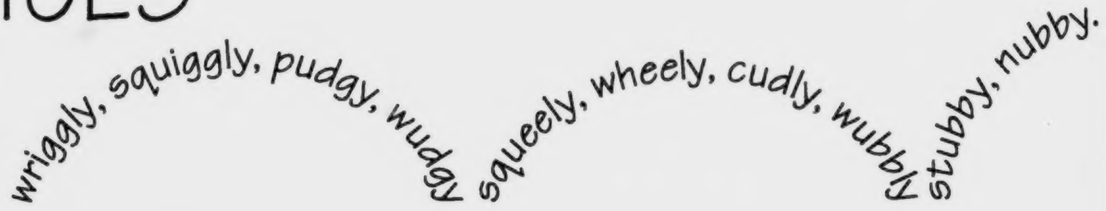
There is no set number of syllables for the tercet. One should be very conscious of the rhyme and rhythm though! And it helps to aim for the same number of syllables in each line, because the three lines are about the same length.

Once you get the hang of the tercet, it's fun and easy. And you'll find they get easier the more you write. So write six tercet poems. Do more if you have the time.

POETIC PICTURES

Some poets are artists, too. They use a shape to give their poetry more meaning. This is called *concrete poetry*.

TOES



wriggly, squiggly, pudgy, wudgy squeely, wheely, cudly, wubbly stubby, nubby.

What shape would you use for this poem? Think a moment. Then try your hand at drawing poetry.

birds, free fly high and why can't I go too?

now use your imagination to create your own concrete ideas.

LAUGHABLE LIMERICKS

A fisherman dangled his line
Pulled in a branch of pine.
But, again casting out,
He pulled up a trout,
And went off to his kitchen to dine.

Limerick Starters

A spinster named Emma McGee...
There once was a teacher named______.
An elephant with a sore leg...
In the cafeteria (school) one day...

Try some of your own laughable limericks. Join in on the fun and nonsense!

TANKA

a. Form five lines of 5, 7, 5, 7, 7 syllables in each line respectively.

b. Example:

"The sparkling snow is
Like a bed of diamonds on
The brown dusty earth,
Lacing a world in a dress
Of serenity and youth."

—G. Hurley

Apply the tanka form of poetry to create your own!

SOME FUNDAMENTALS OF TRADITIONAL POETRY WRITING

A. Verse Forms

1. *Rhymed verse:* usually contains regular meter and rhyme
2. *Blank verse*: iambic pentameter with no end rhyme
3. *Free verse*: no regular meter or rhyme

B. Meter

1. Outline of poetry consists of a unit of meter called a foot.
2. Number of meters determine the name of the line.
3. Meter is the pattern of the stressed (/) and the unstressed (◡) syllables in a line of poetry. The stressed syllable (/) is called the accented or long syllable. The unstressed (◡) is called the unaccented or short syllable.
4. Types of metrical feet commonly found:
    - a. *Iamb:* iambic foot - bĕ lów
    - b. *Trochee*: trochaic foot - dóu blĕ
    - c. *Anapest*: anapestic foot - ĭn tĕr twíne
    - d. *Dactyl*: dactylic foot - háp pĭ nĕss
    - e. *Spondee:* spondaic foot - usually compound words - accent each syllable as chíld hóod

C. Naming the Line

1. Monometer - 1 foot line (bĕ lów)
2. Dimeter - 2 foot line (wórkĕrs éarn ĭt)
3. Trimeter - 3 foot line (thĕ dréams/thăt bý/mĕ swéep)
4. Tetrameter - 4 foot line (thĕ hílls/thĕ méad/ŏws ánd/thĕ lákes)
5. Pentameter - 5 foot line (tŏ érr/ĭs húmăn tó fŏr gíve dĭ víne)

6. Hexameter - 6 foot line
7. Heptameter - 7 foot line - *Casey at Bat* is written in heptameter
8. Octameter - 8 foot line - *The Raven* by Edgar Allen Poe is an example of it.

D. Stanza Forms

1. Recognized by the number of lines it contains
2. Distinguished by number of feet or rhyme scheme
    a. Couplet - 2 lines
    b. Triplet - 3 lines
    c. Quatrain - 4 lines
    d. Quintet - 5 lines
    e. Sextet - 6 lines
    f. Septet - 7 lines
    g. Octane - 8 lines
    h. Lines of 9, 10, 11 are called by their respective numbers.

ONOMATOPOEIA: Imitates A Sound

ŏné-măt́əpēá

Onomatopoeia is the forming of a word to imitate a sound in nature, or any sound. One example of onomatopoeia is the word *buzzing* which is spelled to sound like the noise bees make. If you hear a *buzz-zzz-ing* sound, or see the word, you immediately think of a bee, or any insect that buzzes. For example: Different balls make different kinds of sounds. A big, fat rubber ball might sound like *tap, thump, rat-a-tat-tat, thud,* or *bouncy*. A baseball *whizzes*, makes contact with a bat and *smacks*! Do you remember Batman and Robin on television? Across the screen flashed words like *BOOM! BANG!* These words, or sounds, are examples of onomatopoeia.

Read each word listed below and using only single words, write down the sounds you think each word makes. I will do the first one for you.

birds	tweet	cheep	chirp	whistle
jump rope				
baby				
bee				
spring rain				
wind				
a rickety, worn-out car				
big truck				
thunderstorm				
train				
ocean				
rattlesnake				
big city				
farm				
death				

swimming				
egg frying				
walking on ice				
a tree falling				
car accident				
doorbell				
eating				
drinking				
snoring				
fishing				
hunting				
a toaster				
a door opening				

Continue the list, using other words

MATCH THE SOUNDS

Below, are various sounds which are onomatopoeic. Sound out each one quickly before writing your answer. After you have made the sounds, list the type of animal or object that makes that sound.

1. clip-clop-clip-clop-clip-clop ______________________________
2. caw-caw caw-caw-caww ______________________________
3. splish-splas-hhh-splosh! ______________________________
4. drip-drip-drip-drip ______________________________
5. spla-ttt sp-lat-tt ______________________________
6. knee-deep knee-deep-knee-deep ______________________________
7. arf-arfarf-arf-ARF! ______________________________
8. crash! bang! BANG-BOOM! ______________________________
9. glug-glug-gluggg ______________________________
10. woosh-swoosh-whoosh-swooshHH ______________________________
11. cloing-g-g-g cloing-g-g ______________________________
12. moo-o-o-o-moo-oo ______________________________
13. baa-a baa-a ______________________________
14. a-a-a-acHOO ______________________________
15. ring-g-g ring-g-g-g ______________________________
16. swish-swach-CRACK! ______________________________
17. heeee-hee-hee-hahahahaha ______________________________
18. oh-h-oucH-H! ______________________________
19. arrrrragH! ______________________________
20. shush-shhh! ______________________________
21. purrr-rrrr-me-oww ______________________________

22. grrrrr-uh! ______________________________
23. eeeekkkk-eeeeik ______________________________
24. screech-hhh! ______________________________
25. tee-tum-tee-tum-tee-tum ______________________________
26. cock-a-doodle-doooooo ______________________________
27. brawk-kk-br-awk-kk! ______________________________
28. oink-oink ______________________________
29. cluck-cluck-cluck ______________________________
30. ra-pa-pa-pa-pum ______________________________
31. beep-beep-p-beep-beep ______________________________
32. who-o-o-o-whoooo-who! ______________________________
33. who-oo-whoo-who-o ______________________________
34. twi-twoo-towh-t-t-whit ______________________________
35. twee-tweet-tweet-tweet ______________________________
36. zmmmmmm ______________________________

PERSONIFICATION

When one attributes a human quality to an inanimate object, they are using *personification*. Personification is a comparison that treats things as if they were capable of acting like people and having feeling like people have. Personifications are things we feel but do not literally see. Have you ever heard a person refer to their car as a she? This type of reference is an example of personification.

The next time you go to the library, ask for a book that contains personification illustrations in it. Reading this type of book can be great fun.

Now pay close attention to the following examples of personification:

- The clouds hurried across the sky.
- That star is winking at me!

Normally, only people or animals hurry, but in the first example above, the clouds are doing the hurrying and have been given a human quality. In the second example, we see that the star, not a person, is doing the winking. Get the idea!

HYPERBOLE

hī pûr´ be lē´

Hyperbole means exaggeration. When you make an extravagant or exaggerated statement, you are using hyperbole.

Hyperbole is used as a figure of speech. For example: I could sleep for a year! Another hyperbole is the following: This book weighs a ton! People in Texas use hyperbole all the time. For example, a Texan might say, "Texas is so big you can put the United States in it and still have room for France!"

Below is a list of completed sentences. Read each one carefully and at the end of each sentence write a *P* (for personification) or an *H* (for hyperbole) to denote whether the sentence contains personification or hyperbole.

1. She was big as a house.
2. Their house was so big you could have put a baseball diamond in their dining room.
3. She parked the car so far from the curb she had to take a taxi to the sidewalk.
4. He was so bow-legged he could walk down a bowling alley while the game was going on.
5. The flames called out our names.
6. I'm so hungry I could eat the wheels off a wagon.
7. That's nothing. I'm so hungry I could eat the tail off a skunk.
8. The wind whispered our names.
9. The rabbits are so big down here, kids put saddles on 'em and ride 'em.
10. The clock told us it was time to go.
11. The late afternoon sun bathed the yard in an eerie half-light.
12. The branch tapped at the window, begging to come in.
13. it was so cold my car laughed at me when I tried to start it.
14. In Texas the mosquitoes are so strong and big, they pick up strangers and carry them back over the state line.

15. The fire galloped toward us, gobbling great chunks of the forest as it came.

16. He hit that ball hard enough to fly all the way to Des Moines.

17. Afterwards, silence veiled the garden.

18. The fire kept on going until it crept up the mountain, on the other side of the meadow.

19. He's so mean he eats snakes for breakfast.

20. The rain swirled around us so strong, it nearly lifted us right up off the pavement.

ALLITERATION

ə-lit´ ə-rā´ shon

Alliteration is the repetition of initial sounds in adjacent words, or syllables. One finds alliteration in phrases, lines of speech, or writing where two or more words have the same initial sound. For example: She *went wailing* in the *winter wind*; or the *furrow followed free* (a line from the *Rime of the Ancient Mariner* by Coleridge); or *tearfully telling time*. Alliteration is like playing follow-the-leader in sound. The first word begins with a sound that the second word, or third, etc. repeats. Okay?

Write ten sentences that make sense using alliteration.

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________
8. ____________________
9. ____________________
10. ____________________

ALLITERATION: The Same Starting Sound Game

NOTE: In this activity, as in many of the others, it is often helpful to relate the activity to student experiences. Choose a rainy day to write a poem about rain; or encourage the students to recall particularly vivid thunderstorms. Before having the children attempt the poem, you might also give the children some tangible objects such as flowers or a basin of water to look at, touch, smell, listen to, and taste. Such a heightened sensory awareness tends to stimulate the imagination.

The teacher should ask the children to select three appropriate, descriptive adjectives that have the same initial letter for each of the nouns the teacher gives the children. The teacher might use nouns from the children's vocabulary list.

dark, dank, dreary dungeon
cold, clammy corpsy cave
sticky, slimy, slippery swamp

Variations:

- **Word-salad:** The teacher should ask the children to compose nonsense alliteration sentences, each child contributing one of the words. For example:

  The safe sailing sloop survived several suddenly-sighted submersed snakes.
  A cute, cuddly kid catapulted completely counter-clockwise.

- The teacher should select a theme and ask the class to compose alliteration sentences for the theme. The following are alliteration sentences composed by a fifth grade class on the theme, pollution.

  1. Rampaging raiding rats rummage through rapidly rising rubbage.
  2. Tired troubled travelers trudge through terrible trash.
  3. Smoke stacks sprinkle smelly smoke.
  4. Plenty of people pass a petition to prevent a problem.
  5. Pick a piece of paper to prevent pollution.

The following is an example of nonsense alliteration stories written by a boy, age 7.

THE BAD BRICKS

A billion bad bricks went bickering down the
backroad and went to a ballgame. And
batted ten bases and bickered some more.
The blue billy goat butted them black and blue
to bed and the bad bricks weren't bad anymore.

Moral: If you're bad, you get punished.

- The teacher might begin by giving the class a list of words (e.g., vocabulary words) and ask the students to think of as many words as they can that have the same beginning letter or sound. Then the students are to use as many of the alliterative words in a sentence as they can. The following sentences were written by a fifth grade girl.

1. Snake: slimy, slippery, stupid, silly, strong, snarled, scaly, sly

   The scaly, slimy snake is snared in swamp.

2. Dress: dirty, dainty, delicate, damp

   Donna dined in a dainty, delicate dress.

3. Dinosaur : dangerous, doomed, disaster, dreadful

   Dangerous dinosaurs were doomed when they died.

PLAYING A GAME OF ALLITERATION

1. Your teacher will begin this game by reciting the first sentence below.
2. Everyone will have a turn repeating it.
3. Your teacher will then recite the first sentence again, and recite the second sentence.
4. Everyone will take a turn repeating both sentences, until all ten sentences are recited at one time by everyone. All right, here goes! These tongue twisters are great fun, and you will never forget alliteration!

one one-eyed wonderful wanton

two twirling tahitian toads

three teetering tropical trogons

four frowning four-footed fellows

five flying feathery fedoras

six silly seasick sailors sailing the seven seas

seven simpering simple simons sitting on stumps

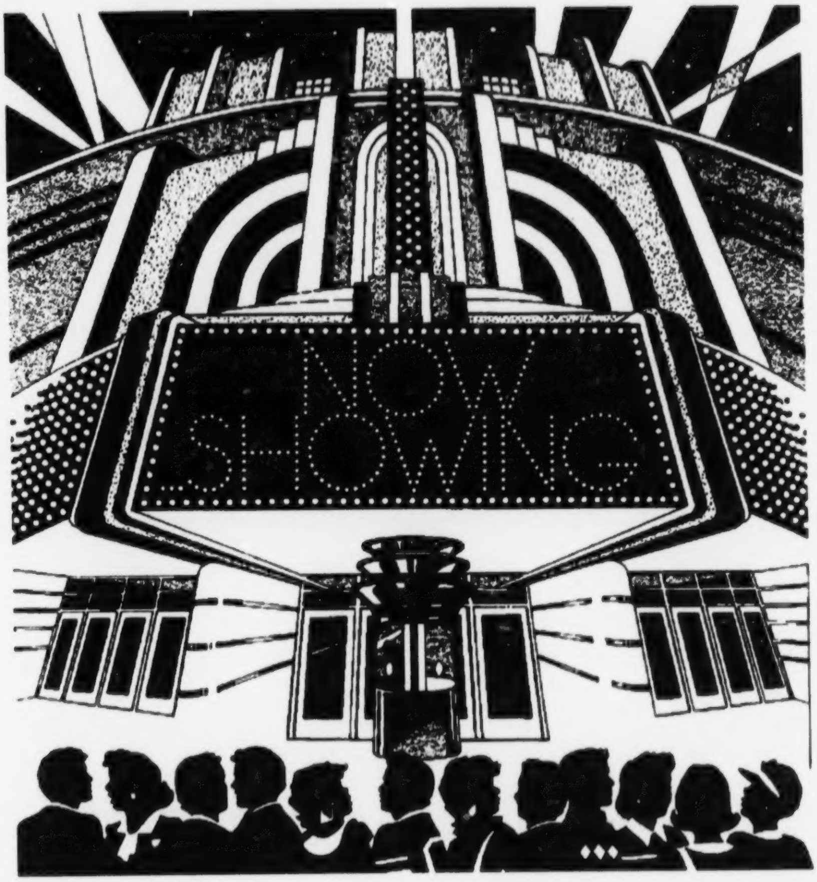
eight egotistical eskimos eagerly experiencing acentric experiences

nine nifty nibbly nuts nibbling nits nats and needles

ten terrible trolls telling two twirling tahitian toads to tumble

Now create your own alliteration game for future use! Compare yours with the others done in class.

THEATER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PROJECT SAGE

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OVERVIEW

Theater involves integrated work of the different methods of creative expression, including painting, modeling, story-telling, acting, speaking, lighting, effects and many more. In this unit, students will have the opportunity to experience the many methods of creative expression while studying:

- Theaters
- Marionettes
- Puppetry
- Pantomime/Mime
- Actors and Actresses
- Costumes
- Shakespeare
- Play-writing

☐ To stimulate interest in the topic of theater, a center should be set up, including books about plays, costume design, puppetry, scenery, mime, theaters, lighting and effects. Such items as playbills and programs, theater stubs, theater critic reviews from newspapers and advertisements of theater productions should also be displayed.

☐ Presented in a learning center fashion, a variety of theater-related activities should be introduced to students, encouraging the use of convergent and divergent thinking skills, as well as exploration of feelings and values.

SHAKESPEARE

1. The 16th century was an age, rich in pattern and decoration when wealthy people were sumptuously dressed. Among poorer and country people, tunics, dresses and headgear were common. However, many of Shakespeare's characters were not dressed in Elizabethan costumes, but in costumes of the different periods they represented. Select a play and character of Shakespeare's and create a costume that would have been worn by this character.

2. If you could interview Shakespeare, what would you ask him?

3. Read *The Taming of the Shrew*. Write a speech of encouragement to Katherine when Petsucchio would not allow her to eat.

4. Investigate Shakespeare's Globe Theatre. How were theaters designed and run at that time? Why is the Globe one of the unforgettable places in the history of the human imagination?

5. Rewrite one of Shakespeare's plays using the same theme. However, use modern-day language. For example, how would Romeo and Juliet be written and presented today?

6. Visit the listening center. Select one of Shakespeare's plays, available in the center. Read along with the record to experience the characters' voices, music and script, written by this great poet/playwright.

7. Write a dialogue between Shakespeare and an advocate for woman's liberation.

8. Compare and contrast two of Shakespeare's plays. Evaluate your feelings after reading or seeing the play.

PUPPETRY

1. Create a sculptured head puppet, following the directions provided. In narrative form, describe your character. How does your character look and sound? How might your character dress or what might he or she prefer to do in his or her spare time? Write lines for your character. Consider how your character might speak in the following situations:

   - when speaking to a small animal
   - when watching a boxing match
   - when losing a game of any sort
   - when asking a favor of someone
   - when discussing things he or she likes to do

   Present a short play that would introduce your character to an audience.

2. Construct an authentic puppet theater.
3. Explore the question, "What is a puppet?"
4. What is the historical significance of the use of masks in religious ceremonies by primitive societies?
5. Investigate the famous dramatic team, Punch and Judy. Do a Punch and Judy show for primary students. Use historically correct characters, plots and scenery.
6. How is puppet theater different in other lands? Create a chart comparing puppet theater in the U.S. with that in a country of your choice.
7. Conduct a classroom debate to present this issue:

   Which is better, puppets or movie cartoons?

8. Explore two of the following types of puppets:
    - spoon puppets
    - rod puppets
    - styrofoam puppets
    - shadow puppets
    - bag puppets
    - glove puppets
    - marionettes
    - sock puppets
    - figure puppets

    Which puppet is better? Evaluate the effectiveness of the puppets you have selected and specify the criteria used in making your decision.

9. Select a puppet play from *Puppet Plays for Special Days* by Eleanor Boylan. Coordinate scenery, music, dance and puppets to the script. Present your production to primary grade classes.

10. How do you try to hide the strings on a marionette?

11. Who created Pinocchio and when? Make a Pinocchio marionette which can help you tell the story.

12. What are the advantages of a marionette over a puppet?

ACTORS AND ACTRESSES

1. List all the ways that you can think of in which an actor is like a fireman.

2. You are an actor in Ancient Greece. What would your life be like?

3. Do you think TV newspeople, weatherpeople and sportscasters need to be actors/actresses? Do two TV sportscasts, one with and one without enthusiasm.

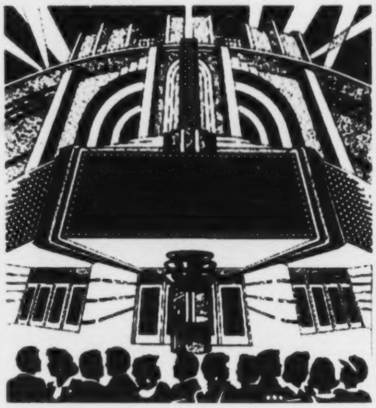
4. What is the most important thing in being a good actor/actress? Have the class members each write their ideas, and tally the results like you would for an election vote.

5. Produce a play that has at least three of your classmates in it. You direct it, and then you will tell what you thought of the performances.

6. Watch a good TV drama and list all the characters. Evaluate their performances and then ask your classmates also to watch and evaluate the same show and characters.

7. Invite a performer to your class to tell how you can become an actor/actress. Prepare an interview.

8. Ask each member of your family to name their favorite actor or actress. In front of the class, do an impersonation of those actors or actresses.



THEATERS

1. Design a word game, using the word *theater* as an integral part of the game.
2. Collect clippings for a few weeks about plays shown in your area. Classify these on a poster into categories (e.g., comedy vs. tragedy, pre and post 1900, musical vs. non-musical, professional vs. amateur presentation).
3. Where is your nearest theater (not movie house)? Call or write to this theater for a schedule of coming events and post it in your classroom.
4. Design an outdoor theater and show the class where you would put lighting, sound, curtains, seats. Make a poster diagram or model of it.
5. Model theaters are fun to build and operate. To investigate the world of toy theaters, present a play using a stage, scenery, and orchestra.
6. What makes a theater a good one? Tell how you would attract people away from TV and movies. Write a commercial.
7. What is *legitimate* theater? List as many shows as you can that play in legitimate theaters.
8. What is *theater in the round*? Put on a classroom performance with theater in the round.
9. How have movies and TV affected theaters? Invite a local actress/ actor to discuss this with the class. Prepare questions.

COSTUMES/MAKE-UP

1. Determine why mime actors dress and apply make-up as they do.
2. What is the importance of costumes in making movies seem real? Do a TV act where you have the wrong costume for the part you are playing.
3. What items of costume or make-up would make you look older? Pick a classmate and see which of you can look the oldest.
4. Create a suit of clothing that you think may be everyday wear in 200 years in your town. Make a drawing.
5. Watch a TV special and see how many costumes you can find. Tell how much you think each would cost to make. Keep a list.
6. Other than for performances, what purposes do costumes serve ? See if you can find pictures of religious costumes and make a collage.
7. Name all the costumes you can remember wearing. Pick a day and ask your class to wear costumes on that day. Discuss what makes a good costume.

PLAYWRITING

1. Children making plays from novels:
    a. Teacher chooses the book.
    b. Reading the book.
    c. Using the stage to get the script:
        1. Listing chain of events.
        2. What would the characters say or do?
        3. Have students choose a scene that interests them.
        4. The whole novel cannot be used. Choose scenes that if cut, would not detract from the interest and drama of the story.
        5. Improvise and think of additional ideas.
        6. Ask students to search for music.
        7. Discuss the art of the period.
    d. Choosing children for parts:
        1. Choose a child who best portrays the character.
        2. Make programs (designed by students) that list the people who are in the play.
    e. Directing and producing:
        1. Understanding the whole person — the many facets of his character.
        2. Learning characterization through improvisation.
        3. Changes are made as strengths and weaknesses are seen.
        4. Have a run-through before a weekend.
    f. Final rehearsals:
        1. Start using scenery as soon as you can.
        2. Organization is essential for the production.
        3. Backstage work.

g. Careers:

1. Assistant Director: watches rehearsals, takes notes, attends to details, keeps a complete script.
2. Production Manager (Stage): coordinates all backstage organization; sees that there is a place for everything and everyone; movement on and off stage is easy—in short, is a traffic manager.
3. Two Stage Managers: keep script as you move along with the writing; prompt on the day of performance (one from each side of the stage); keep track of people backstage to see that they get on and off easily.
4. Set-building crew: use as many as needed - one as head.
5. Property crew: making, gathering and setting up backstage.
6. Costume Crew: makes preparation and has the costumes arranged backstage so as to avoid confusion.
7. Sound Effects: Can be one of the stage managers.
8. Lights
9. Program Crew: Learning the lines - think it through, get the sequence of thoughts, do not memorize blinding.

h. Scenery, Costumes and Properties

- Use books for suggestions about clothing.
- Searching intensifies the character.
- Keep scenery simple.
- Footlights from juice cans
- Use of aisles
- Trips can be planned to get ideas for costumes.

i. The Performance

English skills:

1. The correct form for dramatic writing. That is, it must be written in the first person, and in the present tense.
2. Distinction between direct and indirect quotation.
3. The form and punctuation of dialogue.

4. The need to realize words of another time and place. This is sometimes called *style* or *usage*. One class dealt with the flowery language of the melodrama in the play *Showboat*.
5. Growth of vocabulary and more precise meaning of words.
6. How to give and take directions.
7. The need for content—a message, an idea—to give to the audience. They begin to look for themes in all literature.
8. Improvement of grammar and style— verbs make a story move.
9. Improvement in spelling.
10. Rules of punctuation.

Social Skills:

1. They learn to listen to each other, especially during the writing of scenes.
2. They learn to fight and then compromise for the sake of production.
3. They learn that people they considered unimportant may make significant contributions.
4. They learn that this way of performing is illuminating, and gives them more respect for unorthodox ways of learning.
5. They learn that "hard work" can be a joy and very satisfying. The master builder of a piece of scenery one year stood smiling at it and said, "I love it. I wish I could take it home."
6. They learned the reality of taking on responsibility.
7. They learned — even if they were not aware of it at the time — that to think together and to put that thought into physical action for a social purpose, binds people in life-long relationships.

2. Original Stories as Plays

a. Continued Stories

Both in written and oral form, students can create stories by having one student initiate the story, as other students build on the previous ideas.

b. Paper Bag Dramatics

Fill lunch bags with various objects (props). Divide students into groups of three or four. Distribute the bags containing props and instruct students to create a skit, using the props given.

c. Act-A-Word

Use three different words. The students write a word on three different slips of paper. These slips are folded and put into a bowl or a hat. The slips are then shuffled and each member of the group is asked to pull out three. You will be astonished at all the original stories you can create.

d. Shadow Pantomimes

The idea is to go behind the sheet and act a simple story (or verse) in pantomime. (Nursery rhymes are especially good.) Light must shine behind the sheet. You must be fairly close to the sheet.

e. Characters Who Go On Living

Invent a character who might be humorous, eccentric, strong, intelligent or tricky. Put your character into different situations which do not fit the character. (For example, interchange a smart character roll for a foolish characater roll.)

f. Original Myths and Legends

Why is there no plant life on the moon? Why does a red sky at night mean a fair day tomorrow? Why do pigeons choose to live downtown in big cities? Who carved the first jack-o-lantern and why was it made of pumpkin?

When looking for legends, start with your own neighborhood. If there is an old building or house on your street, can you make up a legend about it? Who used to live there and what became of them? Can you invent a person who once lived on your block? What did he or she do that was great or unusual?

g. Dramatizing Stories (Improvisation)

Evaluation:

1. Were the characters believable? Were they the way the author wrote them? Did you change the characters? If you did, did the change help the story?
2. Did the characters talk as you thought they would? Say enough? Sound convincing?
3. Was any important action left out? If so, when you play the story the next time, remember to include it.

4. Are there any characters you would add to give more color to the story? Who might they be? What might they do?

5. Did you include the scenes you wanted? Were there any more that were needed? Could you have combined some of them?

   Stories to Dramatize:

   Jack and the Beanstalk

   The Wise Empress Jokwa an Her Stones of 5 Colors

   Pandora's Box

   Aesop's Fables:

   The Sun and the Wind

   The City Mouse and the Country Mouse

   The Milkmaid and Her Pail

   Get Up and Bar the Door

6. Situations to Pantomime

   Acting out games and situations is fun, but perhaps by now you would like to try some of your own ideas. From a simple idea or situation, you can create a plot or an original play.

   A situation is not yet a play, but it can easily lead to one. A situation shows characters in a setting, perhaps with a problem to solve. When the characters react as a result of a situation, something new and interesting happens — the situation turns into a play. Here are some suggestions for you to work with:

   a. The building you live in has been condemned and you have had to move. This morning the workers arrive. You have come back to say goodbye to the building that was your home. As you look up at it, you see the wreckers begin their work. How do you feel? Sad? Angry? What do you do? What do you say to the wreckers? Does talking to them change anything?

   b. You are on a hike in the woods. You and your friend have lagged behind to pick up stones. Suddenly you and your friend realize you have wandered from the path and that you are lost and alone. What do you do? After a while a woman in strange, old clothing appears. Who is she? What does she want? Does she help you? What happens?

c. You are washing dishes. You have been wearing your brother's class ring without his permission. Suddenly you realize it is gone. It has apparently slipped off in the dish water. What do you do? Do you find it? If your brother comes into the kitchen, do you tell him? What does he say? How does the situation end?

d. You are going on a bus trip alone to visit a friend. As your bus is called, you reach for your ticket and discover it is gone. You do not have your friend's telephone number and your family has already left the terminal for home. Might some other person come into tho story? See if you can create an interesting plot from this predicament.

e. Someone new, whom none of you like, has recently moved into your neighborhood. Why don't you like him or her? How do you treat him or her? Someone else comes along and teases him or her. In turning to go, the new person trips and falls. How does this make you feel? What do you do? Was the new person hurt? Does that make any difference in the way you treat him or her?

f. You are playing ball in the street. One of you runs to get the ball which has rolled under a car. A purse containing a large sum of money is lying near the ball. Is there anything else in the purse? What do you do with your find? This could be the beginning of a very exciting mystery story. Finish it.

g. A house in your neighborhood ia said to be haunted. You and your friend or friends decide to explore it. Do you see anything unusual? Do you hear any strange noises? Do you find anything there? What happens to you and how does the situation end?

h. Imagine life on another planet. You are there. How did you get there? *What* is it like? Are there other people or beings? What do they look like? Are they friendly, unfriendly or fearful of you? This situation has all kinds of probabilities for action.

i. A magician has just put you back one hundred years in time. What is it like in your neighborhood? What do you see? What do you talk about? Can you be brought back to the present? How?

j. This time you have been put forward one hundred years (into the future). How have things changed? Do you like it in the year 2075? What are people like and what do they talk about? What do they do? Do they have robots? This can be real science fiction.

k. You are in a grocery store when two robbers come in and rob the cash register. Is there anything you can do about it? This can be a very exciting situation in which anything can happen.

l. Imagine a circus. Think of all the acts and people. Clowns, ringmasters, lion tamers, acrobats, wire walkers, sideshows and a brass band. Organize a circus of your own in pantomime with no props. You may want to add sound. How can you suggest high wire walking? Are any of you good tumblers or acrobats? Try out all of the acts, then decide on the parts. A circus offers more opportunities than almost any other situation because it includes so many things. Perhaps you can even invent a plot with circus people. With or without a story, however, this improvisation will be fun.

m. Imagine that you are robots. You are working in a factory when suddenly you become human. What causes this change to take place? How does it happen? Is it gradual? Does it affect one of you at a time or all of you at once?

n. Headlines in newspapers can give you good ideas for improvisations. Take a look at any newspaper headline that strikes your imagination and then, without reading the article, see what kinds of stories you can invent.

o. Think of characters in various well-known books. Then bring two of the characters together. How do they react to each other? If they have lived at different times and in different places, what do they talk about? How do they get along together? You can invent a new story involving Pinocchio and Cinderella, Nancy Drew and Pandora and other pairs.

INDEPENDENT STUDY

Students should be encouraged to expand upon their interests of theater and conduct an in-depth study in a topic of their choice. To direct students toward a topic for an independent study, a brainstorming session would be helpful. As a class, students can form a master list of possible subject areas they may want to pursue either individually or in a small group. The list only provides possible alternatives for in-depth study.

Suggested Independent Study Projects

1. Sponsor a town-wide playwriting contest for students.
2. Make a set of comedy and tragedy masks for your school stage.
3. Produce a play in the style of Chinese Theater.
4. Tape an interview with someone connected with the theater. Edit it, add background music and submit it to a local radio station.
5. Make a dictionary of dramatic terms for the beginning dramatist. Submit it for publication
6. Write your own play. Edit it and send it to *Plays* magazine.
7. Produce an encyclopedia of drama for the primary grades.
8. Edit plays produced for a playwriting contest. Publish an anthology of the best pieces and organize a sale at the Spring Fundraiser or Book Fair.
9. Design a board game about drama and the theater.
10. Make a replica of a theater from the past in any media.
11. Design an activity for the *Purdue Creativity Kit*. Submit it for consideration by the authors.
12. Produce and direct a play for any holiday. Present it at an assembly or to residents of a nursing home.
13. Design a display of costumes through the ages for the local library or children's museum.
14. Write a *Who's Who in Theater* book, incorporating famous dramatists from early Greece up to current time.

15. Keep a log of interesting happenings during the rehearsal phase of a play. Incorporate this information into a playbill.

16. Do a Punch and Judy Show for primary students. Use historically correct characters, plots and scenery.

17. Design settings for a festival of carts.

18. Produce an encyclopedia of drama. Submit it to your local and school library.

PUPPETRY WORKSHOP

Overview

This unit presents the viewing of puppetry as an all encompassing art form, requiring the blending of such arts as directing, acting, writing, designing, sculpture and choreography.

Goals

☐ To create a puppet
☐ To write a puppet play
☐ To plan and present a puppet production.

Teacher Requirements

☐ To read widely in the area of puppetry
☐ To select appropriate materials for puppet presentation
☐ To do research necessary for staging production.

Personal Requirements

According to the student's interest, the student may choose to work in a particular area of puppetry after the overview presentation.

MOVEMENT ACTIVITY

The Mad Puppeteer (ages 5-12)

Mis-strung marionettes and new discoveries in balance.

Unless we are acrobats or mountain-climbers, dancers or athletes, we usually take balance for granted. In this improvisation, the puppets suddenly realize that they can balance from many different points. As a result of each crooked stringing, they must find a new center in their own bodies. It is a fresh concept for most children and a very challenging one.

Premise: A puppeteer works on an assembly line stringing newly-made marionettes. The job gets so monotonous that one day he goes mad and decides to re-string the puppets his own way.

Tell the children to spread themselves out around the room and lie in a heap on the floor; they are newly-made marionettes. You are the Mad Puppeteer. Choose a body part that you will string the puppets by. Call out, for example, "Chin." Then count aloud as you beat six times on a drum, or pot or just clap. During the six counts, the puppets rise to a full standing position, but their chins must lead them because the string is attached to their chins and is pulling on them. After the six counts, drop the strings and the puppets collapse to the floor. Now you are ready to call out a different body part and start again.

Experiment with the idea of the string connections. Get the children to try rising as though the string was coming from the middle of their backs. How would they get up if a string was pulling on their toes or heels? What if it was attached to one knee? Or to a nose?

Remind the puppets that the part the string pulls must stretch utmost, while the rest of the body hangs back.

Now, as the Mad Puppeteer, stand in the middle of the room. Stretch your arms out in front of you, as if you are holding the bar where the strings are tied. When you hold the puppets' strings, you control their movements. In puppet language it is time for the marionettes to go to school, which means they will learn to walk and move, bow and turn, gesture and swing as the Mad Puppeteer dictates.

Let us say that you have just strung the marionettes from their elbows and given them the count of six to rise.

1. Jerk the imaginary bar in the air a few times. The puppets will need to jump up and down leading with their elbows, reaching and stretching them as high as they can.

2. Still holding the invisible bar, run once around the room. The puppets must follow, bodies hanging back, elbows leading in a sideways drag.
3. Still holding the bar, spin around in place. The puppets must do the same, again pulled by the elbow which leads them.

There are many other possibilities. With the puppets watching you closely, you can seesaw the bar from side-to-side, wiggle it, plunge it suddenly and the puppets must respond — elbows first!

Lower the bar gently, and the puppets crumple to the floor. Call out a new body part. In six counts, raise the strings and the puppets are ready to repeat the sequence.

The next time you play, let the children take turns being the Mad Puppeteer. Encourage them to find new ways to move the puppets. Just make sure that all eyes focus on the Mad Puppeteer at all times, and that the movement directions are clear.

DIRECTIONS FOR A SCULPTURED HEAD PUPPET

1. Students will construct armatures and a wood stand to support clay and create their puppet heads. The armatures will be varnished to protect the clay from losing its oil content (into the wood).

2. Students will begin by sculpting a clay head with Roma Pastilina, No. 1 or 2, ordered form Utrecht, Newbury Street, Boston. Students will be creating a detailed face, eyes, lips, cheek bones, facial lines, etc.

3. Students will then gather materials for applying paper mache over the clay sculptured face.

   Newspaper strips and Metylan (special vinyl paste) will be used.

   NOTE: Paper should sit inside paste for 10 minutes.

   Students will gradually cover clay head with paper mache, making sure to fill every crack and detailed area. Students will zig-zag and overlap paper. Let dry.

4. Cut paper mache away from clay, cutting ear at midpoint.

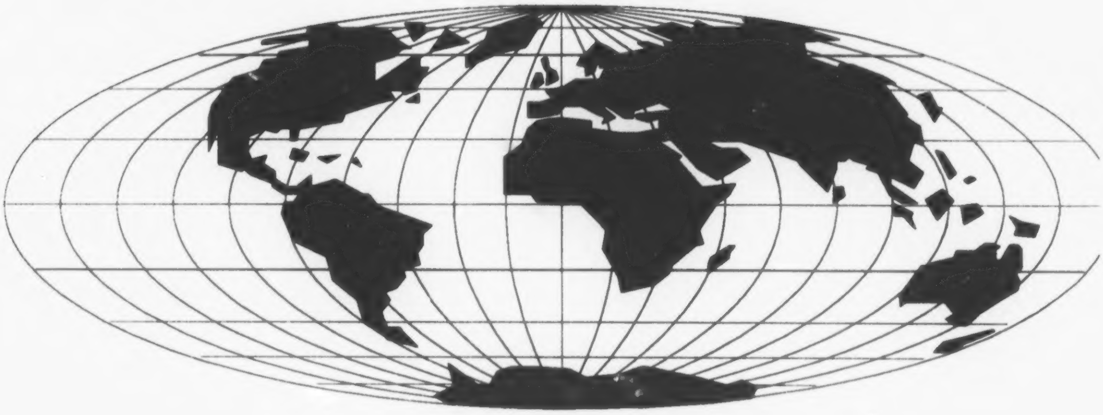
5. Students will reinforce the inside of the head with celluclay (instant paper mache).

6. Paper mache head will then be re-assembled with additional strips of paper mache while the inside of the head is wet with celluclay (so head does not expand). Make tube with cloth, covered inside so finger will fit through (neck). Place in strongly. Allow period for drying.

7. Students will use acrylic paints to paint puppet head.

8. Clothing will be designed, based upon the character the puppet will portray.

INTERNATIONAL BAZAAR



PROJECT SAGE

OVERVIEW

Students will work in pairs to research a foreign country and to learn about the culture, homes, clothing, language, music, art, transportation, climate, history, education, foods and governments of those countries. Students will also learn about various travel spots within the country that would be of interest to a visitor. (See attached sheet on "Guidelines for International Bazaar," which should be given to each student in duplicate; one for school, one to keep at home.)

OBJECTIVES

☐ The students, with the help of a variety of resources, texts, travel agencies, interviews, brochures, travel pamphlets, encyclopedias, will study a specific foreign country and gather information on the above mentioned topics.

☐ Students will use "Guidelines for International Bazaar," and take notes to be handed in on the specific topics listed.

☐ Students will prepare a map of their own design (relief, drawn) to be handed in with other materials required.

☐ Students will plan a travel brochure for a three-day trip through the country, designating spots of interest to be visited.

☐ Students will learn some words and/or phrases from the language of the country.

☐ Students will show by drawings, models, or however they wish, a typical home and style of clothing from the country.

☐ Students will gather samples of music/art of the country, where applicable.

☐ Students will find a typical day's menu from the country and choose a dish they would like to prepare.

☐ Students and teachers will select a day to set up travel booths to display material gathered. At this time each member of each pair should prepare a two to three minute talk on the specific topics researched. Music can be played and maps and visuals displayed.

☐ Teachers and students will plan a day for an International Feast, where each group brings in a dish indicative of the country and a luncheon is held to sample the various "goodies."

☐ Get together to plan which group will make appetizers, main dishes, drinks, desserts. This will vary depending on the countries studied, and the complexity of the recipes.

GUIDELINES FOR INTERNATIONAL BAZAAR

Gather as much information as you can about your country, for you will be designing a travel booth for others to visit. Travel booth suggestions are as follows:

1. Map: Your map will show where your country is located. You might include products. Spend some time; salt and flour maps are fun to make. If you want to make a salt and flour map, mix two parts flour to one part salt. Add enough water to make it the consistency of oatmeal.
2. Clothing: Typical festive clothing. Suggestions: Outline your body on large paper and draw in the clothing, or use heavy cardboard and make paperdolls.
3. Homes: Perhaps you might consider making a model.
4. Language : Learn some expressions.
5. Music: Records, tapes, original songs, dance.
6. Art
7. Transportation
8. Climate
9. Brief History
10. Tourist Spots: Design a brochure planning a three-day trip through your country.
11. Write a letter to your country's U.S. Embassy requesting information.
12. Education in your country
13. Prepare a two-minute talk on your country for those who will be visiting your booth.
14. Plan a typical menu that contains the meals that the people of your country eat daily. From the menu, choose one dish for our class luncheon. Write up the recipe.

15. If possible, interview people who lived in your country.

16. List your own ideas for items to to include.

17. Make a placemat for the class luncheon that shows something indicative of your country.

18. Make a country flag.

UTOPIA

1. Now that you have completed your study of a specific country, you are ready to design a utopian community. This project will be developed through your own ideas.

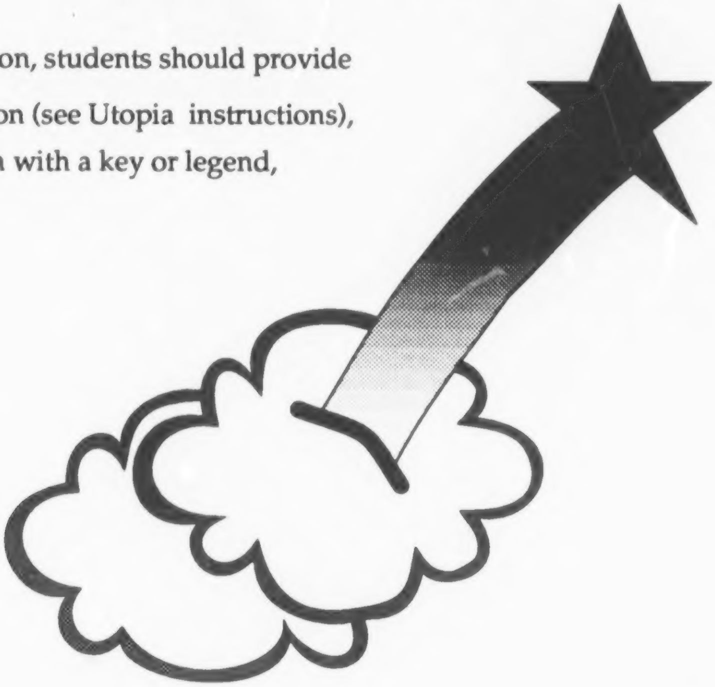
   Utopia is the name commonly given to an imaginary land where everything is suppose to be perfect. Your assignment is to design an imaginary land where —in your estimation, everything is perfect.

2. In describing your utopia, please include the following:

   -location
   -transportation
   -laws
   -customs
   -entertainment and recreation
   -climate
   -clothing
   -education
   -music
   -family structure (child rearing)
   -houses
   -money
   -government

3. For the formal presentation, students should provide

   - a written description (see Utopia instructions),
   - a visual illustration with a key or legend,
   - a map.



AMERICAN INDIANS

PROJECT SAGE

BEST COPY AVAILABLE

OVERVIEW

Let's investigate what we can learn from our own American history that will help us today? The American Indian, for example, began our country's heritage many years ago. Today's descendants of the original tribes are confused, frustrated and angry at what has happened to their land and their culture.

Using texts, encyclopedias, books, magazines and newspapers, examine the following issues:

- ☐ The history of a certain Indian tribe.
- ☐ Compare living conditions in the past on reservations to those which exist on reservations today.
- ☐ Some Indians farmed, some hunted. Why?
- ☐ Study the environment of the tribe—plains, forest, swamp, mountains and deserts.
- ☐ Study tribal customs and ceremonies.

Blackfoot, Cheyenne, Penobscot, Sheshone, Chippewa Seminole, Wampanoag, Crow, Iroquois, Pannee,

Huron, Paiute, Navajos, Hopi, Sioux, Zuni, Arapaho

ORGANIZING YOUR REPORT

1. Make a list of questions that you will answer in your report.
2. As you find and read information in different books and sources, make notes about the things you want to include in your report.
3. Make sure to number your questions and answers to those questions, so that the numbering for the questions and answers coincide.

   Example: If "How did the Indians make canoes?" was Question #1, then notes telling about this should be #1 also.
4. Acquire as much information as possible from sources— books, people, places. Then put your notes together.
5. Follow these rules in writing:
   a. Tell enough information.
   b. Say exactly what you mean.
   c. Tell things in the order that they happened.
   d. Use a separate paragraph for each topic in your report.
   e. Proofread for neatness, punctuation, spelling, and content.
   f. Include a bibliography.
6. Give yourself a pat on the back for a job well done!

LOOKING FOR MATERIAL

Where Do You Look for Material?

- -almanacs
- -encyclopedias
- -textbooks
- -biographies
- -atlases
- -newspapers
- -magazines
- -historical references
- -charts/graphs
- -Reader's Guide to Periodicals

Where Do You Look for This Information?

- -library
- -museums
- -historical societies
- -historica lvillages
- -town hall

Can You Contact Anyone by Phone or Mail?

- -teachers
- -librarians
- -town officials
- -Chamber of Commerce
- -local companies
- -travel agencies
- -state and government agencies
- -state guidebooks

ITINERARY

PROJECT SAGE

OVERVIEW

The Itinerary and state activities allow the student to study either specifically designated states or states of his or her choosing. The student should become familiar with U. S. geography, the history of various states, the economy of the states and the recreational facilities available. The students do the research and gather statistics, while planning an exciting vacation and thereby learning the following concepts in an interesting, informative way.

Concepts:

-geography
-math
-history
-travel
-statistics
-writing skills

OBJECTIVES

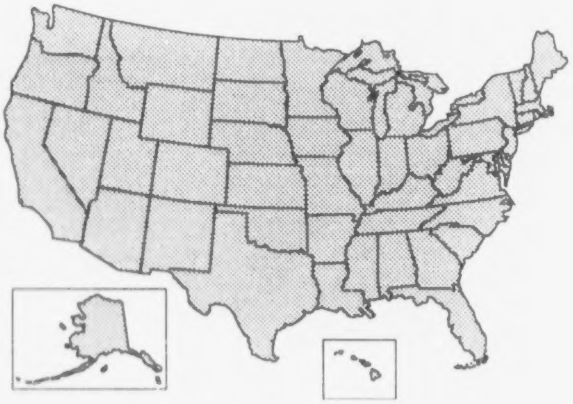
The student will be able to:

☐ understand the basic geographic features of the U.S.—the overlay of the land.

☐ learn specific facts about the particular states, designated or chosen. For example, a state's capital, population, flower, bird, industry.

☐ learn the history, economy, industry, and unusual and interesting facts about the states.

☐ utilize practical math skills by computing mileage, gasoline, food, lodging prices, traveling expenses, tickets and tolls.



☐ acquire a workable knowledge of maps and globes, catalogs, brochures, and travel books. Gather and chart statistics.

☐ gather and chart statistics.

☐ write an itinerary, log and journal of the trip.

PROCEDURE

The students will achieve the stated objectives by:

- ☐ researching the history, industry, and specific facts required for each state visited, by using reference books: encyclopedias, atlases, travel pamphlets, texts about specific states, the game of states, maps, brochures and hotel guides.
- ☐ comparing prices of hotels, motels, gas mileage of different cars, food prices at different types of restaurants.
- ☐ reading maps, map keys, studying routes between state capitals, computing distances between states visited.
- ☐ calling and visiting local travel agents to acquire information brochures, SIA Guides, travel maps.

☐ writing to the state travel bureaus of local chambers of commerce.

☐ keeping a written record of places visited and writing an informative journal or diary/log of the trip.

The State, Itinerary Project and other included activities should be assigned after children have been introduced to and instructed in research and independent study skills. The teacher acts as a facilitator and helps the children to locate and organize material.

ITINERARY

Include several states and their capitols when planning an itinerary for a foreign visitor. State the number of days (___days) it would take for a visitor to travel by car to these places and specify that the cost of the trip will not exceed $____.

Itinerary Plans

1. Plan your route. You may travel through a minimum of five states.
2. Decide the historical, recreational and natural places of interest you would like to visit.
3. Research all of the places you expect to visit. Be able to give a capsule of each.
4. Know the following:
    a. capitol of each state
    b. state flowers of each state
    c. state tree of each state
    d. state bird of each state
    e. most current population
    f. main products - leading industries
    g. state nicknames
    h. sites of interest
    i. major rivers and/or lakes
    j. any interesting or unusual facts
5. Include your state map, labeled with your route.

Travel the U.S.A. * * * Have a safe, fun, interesting trip!

SPIN-OFF ACTIVITIES

There are other spin-off activities related to the itinerary packet, and they can be used either in addition to or instead of the project. Ample time, in class and/or at home, should be allotted for research, organization and presentation.

- Using a motel chain rate, a location folder, and road maps, plan a vacation trip and find out how much it would cost for two, three, four and five people. Include all costs, such as gas, oil, meals, motel.
- Pretend you are a travel tour director and are in charge of taking your entire class on an all-around-the-world tour. Find out how much it would cost. Figure a reasonable profit for your services, then make your tour and brochure to give out, listing itinerary and cost.
- Pretend that you are hired by your state's chamber of commerce to design a brochure, listing several interesting automobile tours around your area. Design your brochure, including routes, distances, time costs and points of interest.
- Pretend you are going to take a trip from your house to London, and then to Paris, to Berlin, to a fourth place of your choice, and finally to return to your home.
- Figure how much the trip will cost including ticket prices (from travel brochures or ads), all new clothes (from catalog), hotel and meal costs, spending money.

MASSACHUSETTS

Plan and Organize

1. You have a week's vacation and would like to go on a camping trip. Plan a trip in Massachusetts. You may want to consider the following:
    a. How many miles you are traveling.
    b. How much time to spend at each place.
    c. How much food to take.
    d. What kind of equipment to take.
2. Plan a trip from Northampton to Sandwich on Cape Cod. Tell the route that you would take. Can you make the trip in three hours? If not, how long will it take?
3. You have a cousin who lives in Westfield, a friend who lives in Acton, and grandparents who live in Fall River. You have two weeks vacation from school and want to visit with them. Plan your vacation. Some things to consider are:
    a. time to spend in each location.
    b. how to get there.
    c. which routes to take.
    d. at which places will you stop enroute to your destinations.
    e. what to take.
    f. what to do with your pets while you are gone.

4. Make a list of all the things that an engineer would have to consider before building a new interstate highway across Massachusetts.

5. Compute the distance from Ipswich to Cohasset. If your car gets 30 miles per gallon of gas, how many gallons will it take to get to Cohasset?

Create

1. Design some symbols that could be used to make maps better. You might want to make symbols for such things as:

    a. road construction

    b. service stations open all night

    c. telephone booths

    d motels

    e. toy stores

2. List all the ways this map could be used.

3. List all the ways a map of Massachusetts is like a water tower.

Decide

1. Your father's new job requires him to travel to Springfield, Greenfield and Pittsfield. You bought your new home in Palmer only two years ago. Decide the following:

    a. Whether your family should move.

    b. If they move, which town should they live in?

    c. What kind of car should your father have?

2. Explain your reason for making these decisions.

3. Decide where you would live if you could live anywhere in Massachusetts.

4. List all the routes one takes to get from Fitchburg to Ludlow. Decide which is the best route to take and explain why you made this decision.

5. Your family is considering moving from Worcester to Amherst. List all the arguments that you can think of—for and against moving.

Predict and Forecast

1. Predict what a map of Massachusetts will look like in the year 2000.
2. Predict what would happen if all the interstate highway were suddenly destroyed.
3. Predict what the map would look like if Boston were at the southern tip of the map.
4. Explain in what ways today's map differs from a twenty-year-old map.
5. Explain how the map would be different if there were no large cities in the state.
6. List all of the things a map maker had to know before making the map of Massachusetts.

REFERENCES AND RESOURCES

Valentino, K. *Challenge Boxes.*

A Cloudburst of Math Lab Experiment. Mid Wety Publications.

Jackson, D. H. *Curriculum Development for the Gifted.*

Our Fifty States. National Geographic Picture Atlas.

ALA books for different states.

State the State cards.

ARCHAEOLOGY: Mini Study

PROJECT SAGE

OVERVIEW

The Sage class room will become an archaeological lab. Students will be introduced to the scientific techniques employed by professional archaeologists. Students will experience how it feels to be an archaeologist: exploring lost civilizations, restoring and analyzing artifacts, making interpretations of their findings.

Concepts:

- ☐ Individual effort and group success are closely related.
- ☐ All people, past and present, have shaped their beliefs and behavior while facing universal human problems and needs.
- ☐ The culture of any society is constantly changing.
- ☐ It is difficult to examine and interpret cultures that differ from ones own.

OBJECTIVES

Students will:

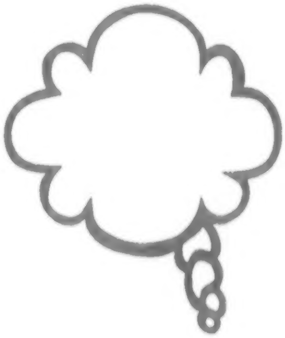
- ☐ become aware of the important contributions ancient civilizations make to today's-world.
- ☐ experience the techniques of field archaeology.
- ☐ become aware of and appreciate the work accomplished by archaeologists.
- ☐ explain that the natural environment of an area affects the progress of a people.
- ☐ identify major geographical regions excavated by archaeologists.
- ☐ draw conclusions about how the natural environment of an area affects a people.
- ☐ understand that religion, art, language, are elements that comprise the cultures of numerous societies.

DIG

Prepare to get your hands dirty! You and your fellow students are about to go on an archeological excavation, or dig. Using the techniques of modern archeology, you will unearth and bring back to the classroom strange and mysterious artifacts for reconstruction and analysis. But this adventure will be the result of your imagination and knowledge concerning the nature of culture.

Where do you begin?

Creating the Culture



Using your imagination, create a culture. Determine the background and themes of a hypothetical culture as indicated in sections 1 and 2 of the attached Culture Universal Sheet. Time may be past, present or future. The setting may range from underwater to desert. Values may be ideas such as "might makes right" or "man over machine." Your entire team must come to agreement.

Each member of your group should select two areas to report. Keeping in mind your culture's time, setting and themes, create ideas for the universal culture you have been assigned.

It is of great importance that you and your team maintain secrecy about your culture. You certainly do not want another team to figure out aspects of your culture.

Creating Artifacts

Artifacts created must be imaginative and symbolic of your culture. For example, if a family and kin universal contains the idea that mates are chosen according to physical strength, instead of a square plaque that states that, a more creative and symbolic approach might be to have an artifact consisting of over lapping rings containing a small bicep and a large bicep. (The word "forever" would be in the culture's language, of course.)

Constructing Artifacts

Before artifacts can be constructed, they must be designed (using the artifact blueprint sheets attached). Artifacts should be limited in size to objects that can be held in the hands. The artifact can be a small part of a much larger object. In other words, a corner stone might be a valid clue to the shape and structure of a very large building. Use a variety of materials when constructing artifacts.

A mural can be an extremely important artifact. It can serve to tie the entire culture together and portray ideas about cultural phases, history and themes.

Create a language and a number system for your culture. After your language has been created, design a Rosetta Stone artifact.

Preparation for the Dig

You will now be placed in the position of working like an archeologist. An archeologist digs to learn as much as possible about the culture of the past. Archeology entails more then collecting arrow heads and mummies. It is a method for recovering the past.

Burial of Artifacts

Your team will have to bury your culture's artifacts. The burial of the artifacts should be carefully planned. There are many possibilities for using imagination here.

Excavation of Artifacts

Employ the methods of an archaeologist during your Big Dig.

Learn about:

- *observation level*: actual field work and data collecting.
- *descriptive level*: laboratory work. The data must be classified in terms of function, material placement in time and space.
- *interpretive level*: This is the mental work!

What does all the above tell us about the people whose remains we excavated?

What was their culture like?

Why did it fail?

Why I did it develop the way it did?

Before collecting all artifacts, view the filmstrip on *The Science of Archaeology*. Collect all the carefully found artifacts and bag them properly for later interpretation.

Analyze!

What is the culture all about? Analyze the artifacts to determine what they may symbolize. On the attached Culture Universal Sheet, provide a written analysis of the culture.

- Decode any language that differs from our own.
- Reconstruct any artifacts that are in pieces.
- Work closely with your team members!

CULTURE UNIVERSAL SHEET

1. Culture Background
    A. Time
    B. Geographic setting
    C. Physical description of people
    D. History and/or culture phases depicted
2. Themes
    A. Values
    B. Ethics - What is right and wrong for the culture
    C. Central symbol which reflects themes
3. Economics
    A. Technology
    B. Division of Labor
    C. Trade and money
4. Food, Clothing and Shelter
    A. Food, methods of production and domesticated animals
    B. Clothing and adornment
    C. Shelter and dwellings
    D. Types of transportation
5. Family and Kin
    A. Marriage and type of family groupings
    B. Child training, puberty and rites of passage

6. Political Organization
    - A. Governmental organization
    - B. Resolution of individual and group conflicts (war and peace)
7. Attitude towards the Unknown
    - A. Religion and religious practitioners
    - B. Death rituals
8. Communications
    - A. Language
    - B. Number system
9. Arts and Esthetic Values
    - A. Music and other forms of expression
10. Recreation
    - A. Games and use of leisure time

ESSAY/DISCUSSION
EVALUATION OF DIG

Depending upon the time you wish to allow, have students write and/or discuss their reactions to the following questions:

1. Are there themes or values that can be found throughout our culture? If so, give examples of how they are reflected in various universals.
2. What artifacts of today would best reflect our culture for archaeologists of the future? Explain, mentioning how these artifacts might also be misinterpreted.
3. Are there any aspects of our culture that could not be shown accurately by artifacts? Explain, giving examples.
4. Use our culture to show how change in one element might effect changes in other elements.
5. Can digging up ancient cultures be of use in solving today's problems?
6. Was the observational, descriptive, or analytic level of archeology the most difficult for you?
7. After participating in DIG, has your attitude towards the socially "primitive" artifacts, found in museums, changed in any way? Explain.

CREATING THE CULTURE

Culture Background

Time ______________________________

Geographic setting ______________________________

Physical description of people ______________________________

History and/or cultural phases depicted ______________________________

Themes

Values ______________________________

Ethics - What is right and wrong for this culture ______________________________

Central symbol which reflects themes ______________________________

ARTIFACT BLUEPRINT SHEET

Culture ______________________________________

Creator of artifact ______________________________

Culture universal which this artifact represents ______________

Front View of Artifact	Side View of Artifact

1. Materials required for construction
2. Written messages to appear on artifact (English)
3. Written messages translated into language of culture
4. Detailed explanation of how this artifact is a valid indication of the culture universal

CULTURAL ANALYSIS

PROJECT SAGE

OVERVIEW

Our group used brainstorming and problem solving techniques to determine the theme and nature of the mini-class activity. We began with several broad categories ranging from undersea life to rituals and values. After our group discussion ruled out the idea of an undersea life project, we began to discuss the possibility of an activity geared toward the student's creative nature. The idea of having the students create a new game was mentioned. However, the possibilities for the game project seemed limited.

The game idea triggered the group's thought processes. The idea of creating new rules was intriguing and caused us to sit back and examine the place of rules, rituals and customs for the project. As the ideas began to flow, we realized that an activity geared toward the purpose of rituals and their place in society would provide many opportunities for high level thinking. Within the final brainstorming sessions, we employed problem solving techniques such as defining and critiquing our goals and asking ourselves questions such as: Have we left out anything? Are our ideas and concepts too broad? Are our ideas appropriate for our students—that is, have the students been exposed to situations which allow for recognition of what we are attempting?

GOALS AND SPECIFIC OBJECTIVES

Goals:

- ☐ to provide a different learning experience from that normally encountered in the ordinary classroom.
- ☐ to apply theory discussed during class lectures in a specific lesson plan.
- ☐ to allow students the opportunity to investigate rituals and values of today's society.

Specific Objectives

- ☐ to increase student awareness of the importance of rites, symbols and customs in our society through role play and discussion.
- ☐ to encourage students to become aware of their own values and the importance of those values in society.
- ☐ to increase understanding of different rituals and traditions in society today through group discussion.

MODEL SOURCES

We have incorporated the following models as sources in preparing the mini-class activity: Bloom, Guilford, Greenwald and Taba.

Hilda Taba's model for Inductive Teaching has lent itself well to our activity. The processes of concept formation, interpretation and application form the basis of mini-class activity. (Please refer to attached lesson plan.) We have incorporated concept formation in our first activity, the skits. The rationale of the skits is to elicit responses concerning the purpose of the rituals or traditions portrayed, concerning the reasons we use rituals such as these, and concerning the characteristics of similar rituals and traditions. We use the techniques of asking questions immediately following the skits to clarify perceptions students have about the skits and its contents.

The second activity involves the students in a role play situation and deals with Taba's model of interpretation. After the activity, the students will be asked to determine the implications and meanings of the rituals and values observed during the role play, to contrast those rituals and values to the rituals and values in society today and to determine the cause and effect of the situation.

Bloom's Taxonomy and Guilford's models were also applied in development of the mini-class activity. Guilford's criteria for the affective domain was used as a guideline in developing a line of questioning about the various feelings about rituals and society. Bloom's Taxonomy was used as an outline for the cognitive domain. The activity is constructed to pull the students' thought processes from the knowledge level through evaluation. During the activity, situations are presented which require judgments to be made and defended and values, which have been presented to the students, to be clarified. Afterdwards, the students will be encouraged to apply what they have learned in the activity.

Greenwald's model served as a basis for the physical aspects of the activity, providing us with guidelines in teacher/learner participation and outcomes. We progressed through the model using teacher initiated activities (the skits) in the beginning, teacher/learner activities in the middle (student role play with provided materials and supervision) and finally, independent learning during the discussion and follow-up activities.

REQUIREMENTS/CONDITIONS

Conceptualization of Activity

- Our mini-activity was conceptualized as a self-contained unit for the class with follow-up activities to accompany it. In preparing the activity, we took into consideration the various abilities and interests of students which might be encountered.

- The mini-class activity fluctuates between type one and type two activities. However, our follow-up activities are type three activities. One of our follow-up activities could be selected by students to do as a group.

Higher Level Critical Thinking Skills Incorporated Into Activity

- The mini-class activity on rituals and values is organized and prepared to elicit the following higher level types of thinking from the learner:
- Cause and effect: What causes society to develop rituals? What effect do these rituals have upon society today? How might these rituals affect society in the future?
- Hypothesis and prediction: What would happen if society had no rituals or values?
- Applications: What new types of values occur in the next 50 years? How could you change the everyday rituals of the people in your immediate community?
- synthesis
- evaluation

Prior Thinking Skills of Students

- We developed the activity for the student who possesses the following:
  - flexibility in thinking,
  - creative thinking skills such as imagination, or originality, inference, extrapolation, and hypothesis,
  - ability to self evaluate and judge.

Materials Needed

- Please see the attached lesson plan.

Anticipated Problems In Implementation

- The major problem in implementation of the mini-class activity will involve the group skits— namely the students interpreting each others skits as to the actions being shown and the values/rituals portrayed. Clear cut directions to the group performing as well as well defined questions will help to elicit the response we desire.
- Other problems which might be encountered are inability to work well in a group due to personality conflicts or lack of previous experience, lack of prior experience in role play, knowledge of social situations limited due to age, inhibition in front of a large group of strangers and comfort in large groups.

PHILOSOPHY AND PRINCIPLES

The skits are designed to be an ice-breaker and to create a relaxed atmosphere, as well as to stimulate initial discussion of our topic. Our aim is to try to have students make new perceptions about the events that occur daily in their lives. We have tried not to give the students a preconceived idea of what is right or wrong. We want them to judge for themselves about the different situations presented. We do not want to inhibit them from making their own evaluations and forming personal opinions.

Key Themes In Creativity

- **Striving for fluency**: With the questions after each play, we want to have the students put as many ideas forward as possible. We hope they will be creative in acting out the stories, thinking up new signs of greeting.
- **Flexibility:** By seeing something new—that is, traditions, rites, symbols, in the stories, this will serve to unlock traditional notions and ways of thinking—perhaps to get the students to look at a new society. They can make inferences on what it all means, and compare what they have seen with what they already know. If they find differences, they should explain the reasons for those differences.
- **Originality:** Interpreting the stories is a guideline. We should welcome changes by the students if they so desire in presentation of their society. "What if" and "if you were" questions at the end will also encourage the students to think of their personal situation and/or the story situations in a creative way.
- **Elaboration**: More far-reaching, effective questions at the end of the mini-class activity pertaining to society's values and students' values, should help the students to combine what they have learned from participating in the anthropology plays with their own situations. Projects given to the students as suggestions (i.e., If you could create your own national holiday, what would it be? How would you celebrate it?) are intended to create a spillover from the mini-class session that they will take with them. Mini-game creation boxes are intended to be a thank you gift from us to them for participation in our class.
- **Teacher roles and styles**: During the first portion of the activity, the teacher's role will be one of direction and motivation: exposing the students to different ideas and then developing questions to elicit critical thinking about values and rituals. As the activities progress, the role of the teacher takes on a less obvious role. He or she becomes more of a stimulator of ideas and a resource person for the group activity. The teacher will also act as a moderator for the discussion following the group activity. The students will generate their own opinions and questions as the discussion takes off (in idea generation form).

LESSON PLAN
(for A Harvest Celebration)

Goals

- To provide a different learning experience than normally encountered in the ordinary classroom.
- To allow students the opportunity to investigate rituals and values of today's society.

Specific Objectives

- To increase student awareness of the importance of rites, symbols and customs in our society through role play and discussion.
- To encourage students to become aware of their own values and their importance in society.
- To increase understanding of different rituals and traditions in society today through group discussion.

Sources

- Content: The content in the activity is original material produced for the activity.
- Theory: Class handouts, *Growing Up Gifted* by Barbara Clark and class lectures.

Materials

Skit Props

stop light
swim flippers
cap
hard hat
lipstick
flag

crucifix
menorah
copies of stories for the groups
follow-up activity sheets
game creation boxes
(boxes containing miscellaneous things such as dice, cards, marbles and toothpicks)

Group Skits

Mapadonia skit:	3 apples drinking straws hats gifts
Harvest Skit:	yellow, blue, white towels shoes sponges

Procedure

- Begin the activity by explaining to the students that we are going to do a series of short skits for them, and we would like them to simply sit back and observe the skits. We will give no other information. We will ask the attached questions, after performing each of the following skits:
  - someone running a stop light.
  - a person coming to school wearing swim flippers instead of shoes.
  - saluting the flag in school, with one person refusing to do so.
  - a woman construction worker running a jackhammer.
  - different forms of greetings: handshake, tipping the hat, bowing.
  - different religious symbols: Menorah and Crucifix.
- After all of the skits are completed and the corresponding questions asked, a general discussion of what all the skits meant will take place. Points to be mentioned include:
  - What did all of the skits portray?
  - Are values/rituals important to society? Why?
  - What other rituals/values can you think of that we have in society today?
- Break students into two groups. Give each group a story, appropriate props and two or three of the teachers resources. Have the students read the stories (see attached) and decide who will take each role. Make sure the students understand they are to role play the values and rituals. Some help from the teachers may be needed in identification of the rituals/values.
- Each group will present their story. After each story, the teacher will initiate group discussion on the values/rituals presented using a set form of questions intended to generate higher levels of thinking as well as questions such as:
  - What rituals were portrayed?
  - How do you know they were rituals?
- Follow-up activity sheets (see attached) containing thought provoking activities will be handed out. If time permits, the first activity will be done as a group. If we run short of time, the students will take the activity sheets home to attempt by themselves.

Criteria for Evaluation

- group discussion after skits and group skits.
- individual volunteering of thought provoking or higher level ideas.

A HARVEST CELEBRATION

Long ago, in the jungles of darkest Africa, there lived the primitive Kawi tribe. The Kawi people lived a quiet life with every member of their land working hard to keep their community thriving. Each person had a job to make up a balance which could be counted on to live from year to year.

The Kawi people were mainly an agricultural society. The prosperity of the community rested on how well the crops of corn and grains grew that year. At the end of each growing season, the tribespeople would harvest their fields and give thanks to One Ton, the god of fertility. The thanksgiving celebration was an event every member looked forward to throughout the year.

Members of the tribe wore colored towels to represent their jobs in the community. The high priest wore a yellow towel, representing his alliance with the gods and the sun. The tribespeople who worked in human services, such as teachers and doctors, wore towels of blue. The members who worked in the fields wore white, to stay cool in the sun.

Shoes were of special importance to the Kawi people. In ancient times the wealthy people wore shoes and the poor were forced to go barefoot. Since the coming of equality every member could afford shoes. As a sign of equality the members shared the shoes with each other. No member wore two of the same pair of shoes. To wear a matching pair of shoes was a social offense.

The harvest celebration begins with the members gathering at their special meeting place. The members of the tribe greet each other in a friendly manner. When the high priest enters, the people show a special sign of greeting. The priest leads his followers to the statue of One Ton.

The statue is a lead weight, propped for display. It represents the need for heavy rains which only One Ton can supply. The high priest leads his people in a sign of prayer and a chant "Kawi-Bunga-One-Ton" (this means the Kawi people thank One Ton). The people offer sponges to the god, placing them on the weight. The sponges are thought to help the god soak up water from the ocean to form the clouds that bring rain.

After prayer, the Kawi people sit down to their festive meal. To remain close to the soil, Kawi people always sit on the ground with their food set before them. As they are seated the members put their heads side by side. This allows them to hear only what is really inside each other's thoughts.

There is much to celebrate. One Ton has been good to them all year. There is food for all and plenty to trade with other tribes. Everything is going well until it is discovered Jarnto, the owner of a large business, is wearing identical shoes! This is a capitol offense indeed. Jarnto realizes that he has made an irreversible mistake. The people carry him to the back of the room where he must sit in disgrace for the rest of the meal. What a disgrace to sit in a chair! Jarnto will never forget to mismatch his shoes after this day.

After the commotion has calmed, the Kawi people finish their feast with food, music and dancing. The members extend a sign of farewell to each other and head back to their own huts. They will all sleep well into the next morning to be ready for another day of work and another year.

You will need to create the following signs and symbols for your recreation of the Harvest Celebration.

- a friendly hello
- a sign of respect to the high priest
- a sign of prayer to the god One Ton
- a friendly farewell

Questions for *A Harvest Celebration*

1. What signs did you use to say:

   a friendly hello?
   a sign of respect to the high priest?
   a sign of prayer to the god One Ton?
   a friendly farewell?

   Why did you choose these signs?

2. Do you think that it is necessary for the members of the tribe to wear different colored towels? What problems could arise from this? How could this benefit a society?

3. Does our society have dress codes like the Kawi tribe? If so, name two.

4. Do you think that this is a totally equal society as the sharing of the shoes implies? Why or why not?

5. Where do you think the high priest sits during the festive meal? Why? What do you think would happen if there was no high priest?

6. Do you think One Ton really had something to do with the Kawi tribe's good crops that season? Does our society have anything similar to One Ton?

7. What was Jarnto's punishment for wearing identical shoes? Do you think that this was fair? Why or why not? How does our discipline system compare to that of the Kawi tribe?

8. Wearing a matching pair of shoes was a social offense in the Kawi tribe. Name two things which could be considered a social offense in our society.

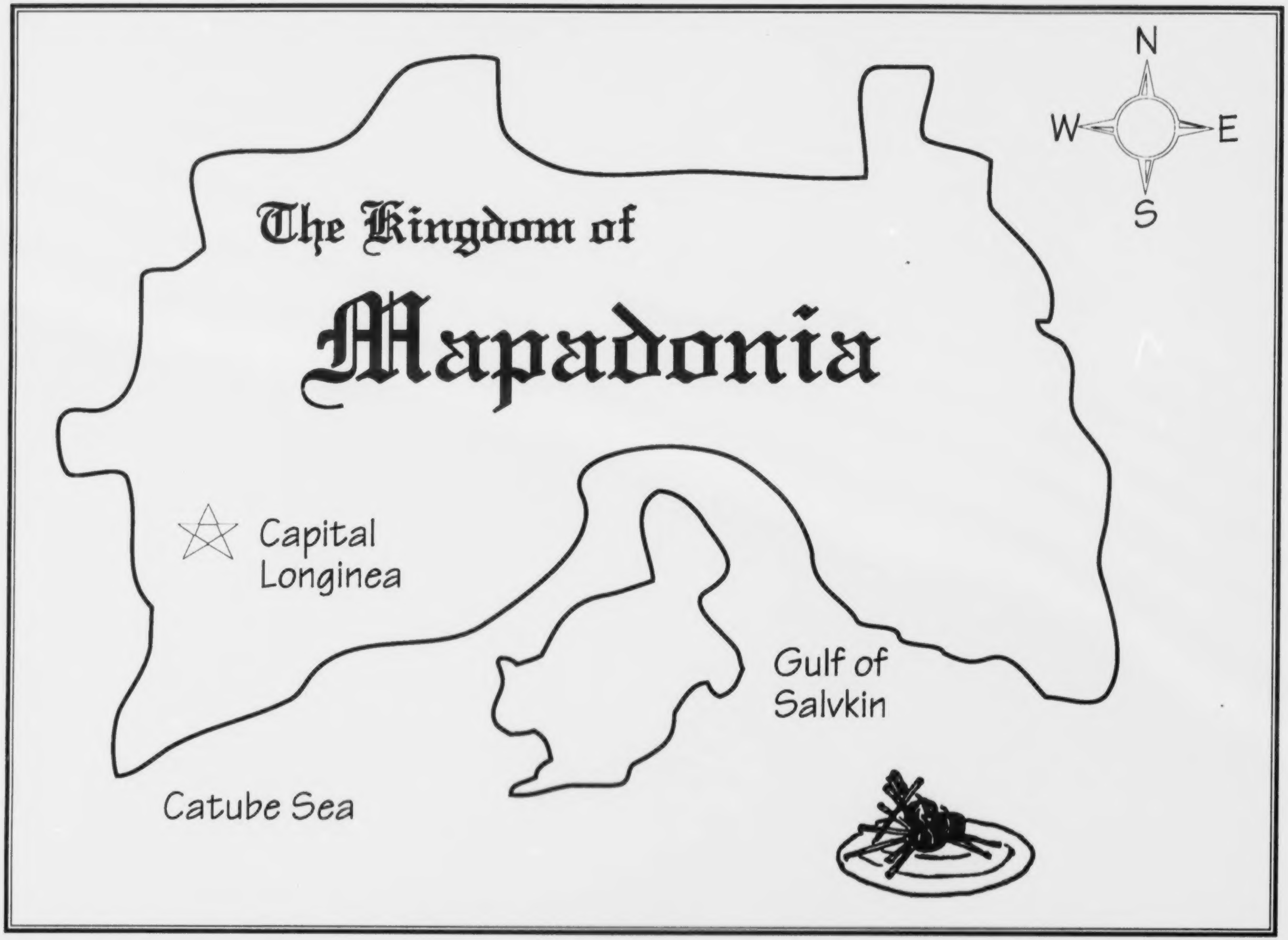
9. Propose an alternative punishment for a lesser offense than Jarnto's.

10. Imagine the different kinds of jobs that would be needed in this society. What would they be?

11. Hypothesize what you think it would be like to live in the Kawi tribe. Do you think that you would like it? Why or why not?

12. Assume that One Ton had not been good to the Kawi tribe and it did not have good crops one year. Describe what you think the celebration would be like.

The Mapadonians Celebrate a Birthday


The Kingdom of
Mapadonia
N
W
E
S
Capital
Longinea
Gulf of
Salvkin
Catube Sea

The country of Mapadonia, although far, far away, somewhere underneath Australia, was in some ways, much like our own. They enjoyed the good life, held elections and had some problems but seemed to hang together fairly well. Many of the Mapadonians felt that their president, President Latitod, was doing an excellent job. One of the things the Mapadonians loved most was birthday parties. So, it was with a sense of excitement, that President Latitod's family, friends and government associates planned the celebration for his birthday.

The traditions of Mapadonia, however, were a little different from our own. Instead of sitting at the head of the table, as the President of the United States would, for instance, President Latitod would sit under the table. This was to show that, although he was their leader, his leadership was based on the willing hands and feet of all the people who had voted for him. Only when everyone had leaned under the table and shouted "Malukano, Latitod," meaning "Come up where you belong, Latitod," would he come out from under the table and then sit on top of it, as was his rightful place.

As was the custom at birthdays, each guest would hand the birthday celebrant two straws, one for the right hand and one for the left. The straws in the left hand symbolized the years already passed. President Latitod threw these up in the air, symbolically to heaven. All the guests tried to catch the straws, as it was considered good luck to be able to catch a heavenly birthday straw before it hit the ground.

Everyone then eagerly awaited the birthday presents which President Latitod would give to each of them. For it was the custom in Mapadonia for the birthday celebrant to give presents to his friends and family in order to thank them for giving him a happy year.

Afterwards, the three birthday apples were brought out. Everyone sang:

Puniko Latitod	(Happy birthday, Latitod)
Puniko Latitod	(Happy birthday, Latitod)
Puniko Latitod	(Happy birthday, Latitod)
Kontubi more.	(Many, many more)

Then President Latitod cut up the apples which symbolized health, happiness and prosperity, and gave a piece to each of his guests. Now, in the land of Mapadonia, the President never wore a hat. His bare head showed the people that his mind was always open to new ideas. However, when eating with the president, especially at his birthday feast, all of the guests were to wear special hats as a sign of celebration and respect. One guest, Vice President Kuni, who was jealous of President Latitod's success, refused to wear the birthday hat. Not only that, he stood up while the president passed around the birthday apples so that he appeared to be taller and greater than the president. When he received the apple, he took it and smashed it on the floor in defiance.

The guests were horrified. Kuni's actions were tantamount to treason, an open rebellion! What would President Latitod do? Two of the guests, who were generals of the army, grabbed Kuni. They gestured to President Latitod that they were going to take him to prison, but the president motioned them to stop. Although he was angry, he knew that Kuni also had the support of many of the people and news of his going to jail would not be popular. Besides, he needed Kuni to help him run the government, and he knew in his heart that he had ignored the vice president and many of his good ideas. As a gesture of goodwill, he came down from the table, donned the hat meant for Kuni and bowed down in front of the vice president. Then he removed the hat, and they both bowed to the guests, showing their open minds. Then, hand in hand, they sat on top of the table showing their solidarity. Kuni asked for another piece of apple which he ate with relish. Everyone breathed a sigh of relief. A crisis had been averted, thanks to the graciousness and good sense of President Latitod. The guests sensed that the two leaders had much to discuss, so they bade farewell to the two leaders on the table top and to each other and departed. The two men sat with heads touching so that their ideas could easily pass from one to the other, and they began to discuss the future of their country.

QUESTIONS
(for the Mapadonians Celebrate a Birthday)

1. First of all, I can tell you that a celebration of some sort was taking place. Do you know what it was? Can you guess?
2. Whose birthday was it? How did you know it was his birthday?
3. What was different about this birthday party from the ones you usually go to?
4. There was not a cake. What did they use instead? What do you think the apples meant?
5. We use candles to show how many years have gone by. What did the Mapadonians use?
6. What did they do with the straws?
7. It was a symbol of something. Can you guess what it might have meant? If it is your birthday, where do you sit at the table?
8. I will tell you that the birthday celebrant was the President of Mapadonia, President Latitod. Why do you think he sat under the table and then on top of the table?
9. Somebody did something wrong at the party. Do you know who it was? What did he do or not do? Why was everyone so upset?
10. How did President Latitod handle the situation? In your opinion, did he do the right thing? What would you have done?
11. What if Vice President Kuni had been arrested, what might have happened?
12. At the end, why do you think they were touching heads as they talked to each other?
13. What do we do when we are trying to explain something to someone? How do we try and make sure they understand what we are saying?
14. What other tools for understanding do we use other than language?
15. Suppose you could not hear or read lips. If you saw a birthday party on TV, would you know what it was? How?

16. How do you know when to change classes?

18. Which side of the road do you drive on or ride your bike on? Why do we do that?

19. Have you ever been in a situation where you were not sure what the 'right' thing to do was? How did you learn?

20. What is the purpose of what we call social conventions or customs? Do you think they are the same all over the world? Do you know of any customs that are different from ours?

21. If we make a treaty with another country, how do we do it? Do you know what the American Indians did when they made a treaty?

22. Can you think of any ways we could increase understanding among people?

23. Suppose you were a businessman trying to clinch a deal with someone from another country. What types of things might be helpful to you to know before you start negotiating?

CHARADES

The purpose of this activity is threefold. First of all, the activity will be used as an ice breaker. The charades are planned to be humorous and thereby encourage laughter, joking and a comfortable relationship within the group. Second, the activity will be used to determine, in part, at what cognitive level students are working. Although the students are predetermined to be exceptionally intelligent, this initial activity will give the teachers a better feel for what depths the lesson can be taken. Third, the activity is designed to introduce the main idea of the lesson. The goal of the lesson is to help the students understand how customs and values come into being. This activity will deal with customs and values that are familiar to the students and easy for them to understand. From these the lesson will move into less familiar or unknown areas.

Six charades are planned. Depending on the amount of time and the students' ability to grasp the concept, some of these may be cut out of the activity. The charades are:

- Stoplight at an intersection. When the light turns red, a car proceeds to drive through the light.
- Flippers—a group of friends are talking when another friend joins the group. The new arrival is wearing flippers for shoes and the group begins to giggle at him or her.
- Flag—a group of people is pledging allegiance to the U.S. flag but one member of the group refuses to participate.
- Hard hat—a group of hard hat workers are performing a job. It is discovered that one of them is a woman and she is not accepted by the group.
- Greetings—a variety of Christian and Jewish symbols will be displayed.
- Symbols— variety of Christian and Jewish symbols will be displayed.

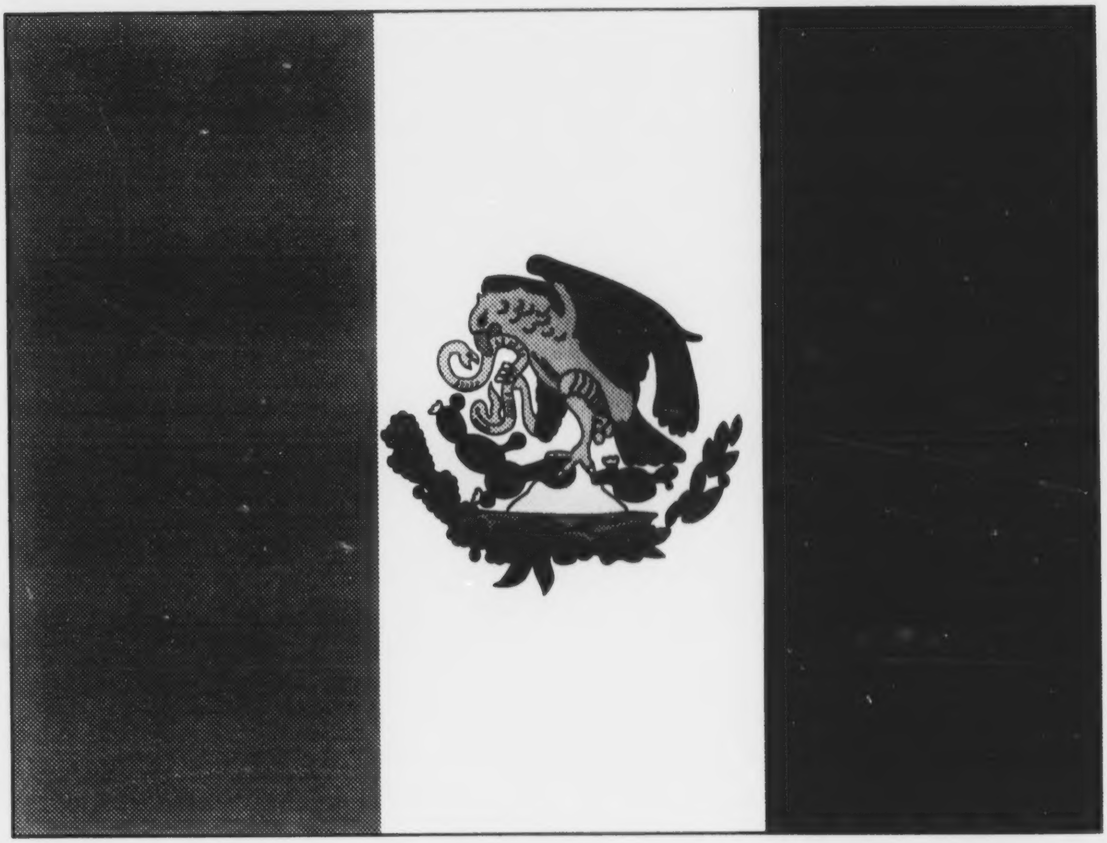
The activity will begin with the teachers performing the first charade. After the charade is over the students will be asked to discuss what happened in the charade, what was different, why was it different and what is the normal situation. The other charades will be performed in a similar way. The culmination of customs, values and traditions will be discussed, along with how they come into being, are they necessary and what do they signify.

OTHER QUESTIONS TO ASK OR TOPICS TO DISCUSS

- What are some of the rituals and traditions you observe?
    - Do they serve a function in society?
    - Are they necessary? Why?
    - Are some more important than others?
- Do you think a society's need for a particular ritual or tradition may ever change? Can you think of any examples?
- In view of the above, what significance do rituals and traditions have for you in regard to your home and family life, religion, school, society as a whole?
- List some important rules or traditions followed in your school or classroom.
- Write a story that shows how and why ritual(s) or tradition(s) came to be.
- What would school be like without them? Explain.
- Develop your own ideas, school rules and traditions. Explain how and why you chose them.
- Does this system of behavior help to show others the things you feel are most important in school? Explain.
- List some holiday rituals or traditions you and your family observe.
- Did you ever ask why you had to join your family in a particular religious or patriotic holiday celebration? Describe the event you questioned. Why didn't you like it?
- Do you think life would be more pleasant without such traditional celebrations? Explain. Do you think everyone in your family would agree with you? Why or why not?
- Choose one holiday and discuss its particular symbols, rituals and traditions. Use your imagination and present possible reasons why these rituals developed.
- Create your own holiday. Describe all the symbolism and rituals to be observed.
- What would a stranger who watched you celebrate your holiday think you valued most?
- Do you think our traditions, symbols and rituals reflect our value system? Give examples and explain.
- Develop a new dress code for living in outer space or an undersea habitat.
- Draw sample outfits. Explain how and why the outfit was designed.
- Does your school have a dress code? Do you and your peers have an unspoken dress code? Describe and explain how and why you think it evolved.

- What do you think happens and/or should happen to people who go against the dress codes? Explain.
- Develop a new region with symbols and traditions. Observe.
- In describing this new religion, please include such information as the location, climate, main occupations, family lifestyle, educational level of the people where the religion develops and gain in popularity.
- How does the ritual, symbolism and traditions that develop reflect the needs of these people?
- Pretend that you are an anthropologist from another galaxy. You have landed on Earth and somehow wandered into the classroom you usually attend as a student. Observe and record the tradition, rituals and symbols used by the teachers and students.
- What would the anthropologist be able to tell you about the class as a group, the teacher and various individual students in terms of the above observations?

MEXICO



PROJECT SAGE

INTRODUCTION

South of the border of the United States lies a mountainous land, a land rich in color and contrasts. This land is Mexico. In this jet age, no city in the United States is more than a few hours distance from Mexico. From four of our states, one can walk across the Mexican border and be in a foreign country. The language is different, the money is different, the food and clothing and customs are different, excitingly different.

The people of Mexico have struggled long and hard. After centuries of oppression and turmoil, we see a nation of healthy, intelligent, hard working citizens. Although they differ from the United States in many ways, they are inspired by identical ideas. At home, the Mexican people work hard and with ever greater success to improve their economy and social structure. In the world, they strive for enduring peace based on spiritual values and justice.

Today we see a new people. Through a comprehensive study of Mexico, we can discern signs of the struggle waged by the people. They've struggled to overcome difficulties created by the dramatic contrasts of their country's geography, by the diversity of its climate and by economic inequalities which are now becoming a thing of the past. This study of Mexico follows logically after the students' study of global geography and the United States.

OUTCOMES

A. In terms of pupil behavior:

I. Understandings

a. General understandings: As a result of activities in this unit, the student will acquire knowledge and insight regarding the ways in which people live and how those ways relate to various factors such as:

1. natural environment
2. centers of population
3. backgrounds and customs
4. industry
5. agriculture
6. transportation
7. communication
8. education
9. population movements
10. provisions for basic needs
11. governmental systems
12. natural resources
13. human resources

14. welfare
15. culture
16. religion

b. Specific understandings: As a result of the activities in this unit, the pupil will learn:

   1. the location of Mexico—its size and its relation to his or her own country.
   2. how the land and the great population present serious problems to Mexico.
   3. the contrast in governmental structure between the United States and Mexico. Mexico has a democratic government. Even though the 1910 revolution led to the formation of a single party that has controlled the government ever since, the result has not been a dictatorship as in the one party communist nations.
   4. that progress in Mexico is changing many aspects of Mexican life.
   5. the need for raw materials by the developing industries of Mexico.
   6. the role that climatic and topographic influences play in the development of natural resources.
   7. the trade routes and shipping methods of Mexico with the United States and other countries of the world.
   8. the influences of technological advances and industrialization upon the prosperity of the Mexico people.
   9. about the development of urban centers.
   10. about Mexican trade, defense and mutual aid agreements.
   11. about Mexican cultural influences on the United States.
   12. about growth and economic ties between Mexico and the United States.
   13. common historic factors in the growth and development of the United States and Mexico.
   14. about the Influences of the American Revolution upon Mexico struggles for independence.
   15. about the formation of trade alliances and economic relationships.
   16. the role of compromise in international affairs.

17. customs, duties, tariffs and taxes.

18. about immigration and emigration.

19. government's role in the promotion of tourism.

20. that interdependence is a constant factor in human relationships.

21. that one of the factors affecting mans mode of life is his natural environment.

22. that the Mexican people may be characterized by such terms as "hardworking," "warm" and "hospitable."

II. Value Patterns:

As a result of work in this unit, the pupil will learn:

a. about the contributions Mexican immigrants make to the United States.

b. that all human beings are one biological species, within which occur variations, called races and that the differences between races are negligible.

III. Skills and Abilities:

As a result of participation in this unit, the pupil will learn to:

a. work effectively with committees and class.

b. to utilize all available materials in attempting to solve problems.

c. to interpret illustrative materials, such as maps, study prints and other visual materials.

IV. In terms of generalizations:

A child may have many worthwhile and enriching experiences while doing a unit of work, but may miss the underlying basic social principles. The following concepts and generalizations should be considered before beginning the unit activities.

a. Topography is a factor in determining the contrasts found in a country.

b. There are regional as well as urban and rural differences in Mexico.

c. The Mexicans make intensive use of their land resources.

d. A natural social unit is the family.

e. Religion, ceremony and traditions are important in Mexican life.

ANALYSIS OF THIS UNIT IN TERMS OF CONTENT

- ☐ How has the geography of Mexico affected the life of the people?
  - What is the size of Mexico as compared with that of the United States?
  - How is Mexico shaped?
  - What are its topographical differences from region to region?
  - How have these differences affected the culture of the people?
  - How does the rainfall compare with that of the state in which you live?
  - What is an earthquake? A volcano?
  - Why is Mexico subject to earthquakes?
  - What are the natural resources of Mexico?
  - What is a plateau?
  - How were Mexico's highest mountains formed?
  - Are there any important rivers in Mexico? Are they useful?
  - Why do most people live in the highlands and avoid the lowlands?
- ☐ What are conditions like in a Mexican farming village?
  - What are the most common crops?
  - What are the most common animals?
  - What is the average size of the farms?
  - How do Mexicans fertilize and irrigate their lands?
  - What was the Hacienda system?
  - Why are most of the huge haciendas no longer in existence?
  - What is being done to reclaim soil that is now wasteland?
  - How is the government of Mexico trying to help their farmers?
- ☐ How important is industry and commerce in Mexico?
  - What are some of the important industries in Mexico?
  - Where are the important products of Mexico developed and produced?
  - What are some of the major obstacles to industrial development in Mexioc?
  - Is there a connection between small scale and large scale industries?
  - In what kind of industries do the Mexicans excel?
  - Is there a connection between small scale and large scale industries?
  - In what kind of industries do the Mexicans excel?

- What is the basis of Mexico's export trade? Its import trade?
- How has Mexico's foreign trade changed since the post-war development of industry?
- What is a system of barter? How does it apply to Mexico?

☐ What kind of homes do we find in Mexico?

- What materials do the villagers use?
- How do the homes in well-to-do sections of Mexico differ form those homes in the rural area?
- Do the city apartments there differ from our appartments?
- What furnishing are absolutely essential in our homes?
- Compare this list with the furnishings in a Mexican home.
- How does the life of a Mexican change when he or she lives on a Hacienda, or in a village or in a big city like Mexico City?

☐ What kinds of food do most of the people in Mexico eat?

- What fuel is used for cooking?
- What utensils are used in cooking?
- Do the Mexicans grow all their agricultural products solely to feed their own population?

☐ What are the schools like in Mexico?

- What changes have taken place in the schools since the 1940's?
- What is the dynamic new idea introduced by the government which brought learning to millions of Mexicans in every part of the country?
- What is compulsory education? Is it enforced in the United States? Is it enforced in Mexico?
- How are Mexican schools like our schools? How are they different? What subjects are studied in Mexican schools?

☐ What is the history of Mexico?

- What are some of the major concerns throughout history that have dominated Mexico?
- What is the major religion of Mexico?
- How has the recent progress affected Mexican traditions?
- How is Mexico governed?
- How is the government of Mexico divided?
- What is the influence of the Toltecs, Aztecs and Mayans?
- How is the government of Mexico similar to our government?

  - How is Mexico's president elected?
  - What is "trial by jury"?
  - How does Mexico pass judgement on criminal cases?
- ☐ How do the Mexicans travel and carry goods?
  - In what ways are goods carried?
  - What vehicles are seen on city streets?
  - What transportation is available in the rural areas?
  - Are animals used for transportation purposes?
- ☐ How does the clothing worn in the rural areas differ from that worn in the cities?
  - How does climate and a person's occupation affect the type of clothing he or she wears in the cities?
  - What type of footwear is worn?
- ☐ What is a "fiesta"?
  - Do you know any Mexican folk dances?
  - What are some Mexican customs? Are they similar to those of the United States?
  - What is a "pinata"?
  - Do you know any Mexican folk songs?
  - Have you read any Mexican folk tales?
- ☐ What sports are enjoyed by Mexicans?
  - Do the Mexicans take part in Olympic games? In what sport do they excel?
  - What games do the children play? Are their games like the games we play?
- ☐ How is a Mexican's religion reflected in his or her life?

SUGGESTED ACTIVITIES

A. Initiating the Unit

I. The room should be arranged to stimulate the children's curiosity and to satisfy their desires to manipulate objects and share their discoveries.

a. pictures (commercial)

1. various types of homes
2. people in western and Mexican-type dress
3. transportation in city and rural areas
4. Mexico-primitive and modern times
5. "Mariachi"
6. school houses
7. agriculture, industry, commerce
8. famous men of Mexico

b. magazines, pamphlets and books about Mexico

c. exhibits

1. adobe
2. peso
3. rebozo
4. serape
5. tortilla
6. Mexican flan
7. sombrero
8. jewelry
9. handcrafts
10. piñata
11. huaraches
12. maps

d. filmstrips

B. Group Activities

I. A country's climate and its effect on its topography, vegetation, and animal life are major determinants of its peoples progress. The natural environment of the United States and Mexico is similar in many ways. There are also geographic variations which alter the economic life of each nation and make its specific character unique:

a. Discuss how the location of Mexico influences its relations with the United States, Central America, North American Continent, South America, Western Hemisphere, and Equator.

b. Compare outline maps of Mexico with maps of the United States.

c. Make a pictorial map, depicting the states and major cities of Mexico.

d. Develop a classroom relief map of Mexico.

e. Compare the physical features of Mexico with those of the United States.

f. Locate the physical features of Mexico such as important mountains, plateaus, gulfs, harbors, peninsulas.

g. Make a cross-section map of a country showing the country's surface elevation. Discuss how people live at various altitudes.

h. Show the film-strip: *Mexico, The Land and Its History*.

II. All democratic governments have things in common with one another. How does the government of Mexico compare with our government?

a. Make a classroom chart that shows the commonalities among the branches of Mexican and the United States governments.

b. Set up two groups that will play-act a trial—each group play-acting the same case. Have one group play-act the trial as it would occur in the Mexican court system, and the other group play-act the trial as it would occur in the U.S. court system.

c. Have oral reports and debates presented to the class on the duties of the president of Mexico versus the duties of the president of the United States.

d. Discuss what makes a government or nation democratic.

e. After having students study the U.S. and Mexican consititutions, write a booklet entitled *"Freedoms We Wish to Preserve."*

f. Show a film-strip of how, in Mexico, representatives are elected, laws are passed and courts operate.

III. Mexican liberties and freedoms were won by a long struggle and at great sacrifice.

a. Prepare oral reports based on the major periods in Mexican history and represented by study-prints shown in class.

b. Create a classroom environment which features major historic periods:

1. that depict Toltec, Olmec, Zapotoc, Maya and Aztec civilizations.

2. that refer to Hidalgo, the wars with the United States, Juarez, Maximillian and Pancho Villa.

3. that disiplay student written biographies of a few of the men who helped make Mexico a free nation.

4. Discuss the differences and similarities between Mexican and American history.

5. Have an Independence Day Parade for September 16th. *The First Book to Mexico,* written by Sam and Beryl Epstein is an excellent resource for this activity.

6. Display a large Mexican flag, or have the class create a replica for the classroom, using a sheet and dye.

7. Carve replicas of the Aztec god of corn and the Maya rain god from soft wood or soap, after viewing a sample of each.

8. Discuss the reasons why Mexico has developed in the ways it has, and decide to study the factors which have influenced living and working conditions in Mexico today.

9. Make a timetable of Mexican and American history.

IV. The major occupation in Mexico is farming. In the agricultural regions are many plants which had their origin in Mexico: corn, tomatoes, cocoa, and avocados.

a. Have the class write a script to dramatize farming in the rural areas of Mexico.

b. Make a model farm or village, that shows the buildings, animals, people and plants.

c. Have each student make a map that shows the agricultural land and food production. Compare this information to the population density and Mexico's food problem.

d. Write a creative story about working in the fields, emphasizing the need and value of Mexican farming.

V. Mexicans have launched an all out effort to industrialize their country.

a. Make a large relief map, indicating the industrial centers and the locations of Mexico's natural resources.

b. Have the pupils work in committees and report on a topic related to Mexico's world trade. Possible topics are:

1. Why is trade important to Mexico?

2. What countries does Mexico trade with and why?

3. What goods does Mexico export and why?

4. What goods does Mexico import and why?

Committee reports should be given in an interesting way — panel discussion, radio or TV programs, quiz shows, graphs and charts.

VI. The basic biological and psychological needs of all men are the same regardless of race, religion, nationality or culture. The people of Mexico differ from Americans only to the extent that their environment is different. Aside from these superficial things, they have the same needs and aspirations that we have.

a. Listen to stories about different types of people in Mexico.

b. Browse through and discuss a Mexican newspaper (available from L.O.F. Mexico Kit).

c. Listen to examples of Mexican radio programs, broadcast to the various classes of people.

d. Examine and compare pictures that illustrate Mexican people in their natural environments.

e. Read about people living in Mexico and how they came to that country.

f. Find out what languages are spoken in Mexico and find out why.

g. Examine travel folders from Mexico.

h. Examine and compare pictures which show the different types of homes the Mexican people have built. Draw plans and build a replica of a typical Mexican house, using various materials.

i. Invite someone who has visited Mexico to present their impressions of the poeple to the class.

j. Plan and make a mural that depicts Mexican life.

k. Act out (in pantomime) the different ways the Mexican people earn their living.

l. Collect folktales and legends of Mexico. Publish a booklet, choosing favorite selections.

VII. Recreation is a universal need—its expression being intimately related to the various phases of development of an individual or group. Recreational patterns in Mexico are greatly influenced by the nation's history and religious practices, as well as modern Western ideas.

a. Listen to Mexican folk dance music. Learn the various folk-dance steps and join in with rhythm instruments.

b. Examine pictures that show recreational activities in Mexico. Learn how to play various games such as:

"Little Clown"

"The Little Ball or La Pelota"

"Fruits"

"Coyote and Sheep"

"Romplendo La Pinata"

A good resource on this topic is *Games of Many Nations,* E. O. Hirbin, Abingdon Press, 1966.

c. Make a pinata.

d. Make a book of the indoor games characteristic of this country. Demonstrate how to play them.

CINCO DE MAYO

VIII. The ability to communicate effectively in a common language is the most beneficial tool for raising the standard of living. The lack of a universal language is one of the major problems Mexico needs to solve in order to raise the standard of living of the general rural population.

  a. Compare the city and rural schools in Mexico, using flat pictures for illustrations.

  b. Compare Mexican schools with our schools and use flat pictures for illustrations.

  c. Write imaginative stories about visiting a Mexican school.

  d. Conduct a panel discussion about the problems of education in Mexico and the progress being made to solve these problems.

  e. Try writing simple letters in Spanish to children of a selected school in a Mexican town, using simple illustrated picture dictionaries. Names are available through the Red Cross.

X. Number experiences:

Numerous sections in this unit provide number activities. For example:

  a. Timetables can be used to figure the time it takes to fly or go by train and boat from where the children live to a principal city in Mexico.

  b. Draw plans for a Mexican house.

  c. List the names and denominations of Mexican currency and its equivalent in U.S. dollars.

  d. Compare the area and population of the pupil's state with that of Mexico.

XI. Maps

  a. The child should be made aware that maps are accurate to the smallest detail. In reproducing maps, the student must maintain this accuracy.

  Maps can be made by:

  1. Using slides and projecting them.
  2. Tracing them without defacing the book from which they were taken.
  3. Using a pantograph.

b. Children should be taught how to make maps (relief) using following materials:

   1. salt and flour
   2. paper mache
   3. clay

c. Children should be taught how to reproduce flat maps.

d. Maps depict certain types of data about a country. The student should become aware of the following types of data:

   1. the political divisions of a country
   2. the country's physical features
   3. the airline, train, ship and bus routes
   4. the weather (rainfall, arid conditions and trade winds)
   5. the products of the country
   6. the events in history (routes of exploration)
   7. the population
   8. the time zones

e. Maps of various types should be studied:

   1. the contour map
   2. the global map
   3. the projection map
   4. the globe map
   5. the space map

f. Children should know the meaning of the abbreviations, signs, and terms that one usually finds on a map.

XI. Language Arts

a. Plan an imaginary trip to Mexico with emphasis on passports, visas, health shots, kinds of clothes to take and money exchange.

b. Collect menus from foreign restaurants and make a dictionary of the meanings of the names of the foods listed.

c. Make a picture dictionary of the of the costumes, native animals, native plants and foods of Mexico.

d. Write a log or diary about life on a rural farm.

e. Make a "good neighbor" bulletin board for Mexico and on it, place current events taken from newspapers, radio and television broadcasts and pictures you have drawn of places and people of Mexico.

f. Dress puppets in native costume. Write and produce a play, showing the daily life of the people of Mexico.

g. Construct a travel bureau booth. Make posters to advertise the country to be visited. Collect pictures and sample products of Mexico. Give sales talks to encourage the class to visit Mexico.

h. Make lists of new words that have arisen out of this unit such as *plateau, navigable, lagoon, arid, nomadic, artisan, dialect, aqueduct, causeway*.

i. Read about the following to learn the story of Mexico:

   1. the Indians of Mexico
   2. the Toltecs, Aztecs and Mayans as organized tribes
   3. conquest of the Aztecs by Spain (Cortez)
   4. Mexico under Spanish rule: mining, life on the hacienda, contribution of the Spanish priests
   5. Mexican independence from Spain
   6. Mexico under rule of France
   7. years of war before Mexico became a free country
   8. the United States of Mexico
   9. the New Republic of Mexico
   10. Mexico's gold rush

11. churches, homes, farms and cities

Welcome	Bienvenido
ENGLISH	SPANISH

12. schools, transportation and health

13. Mexico's efforts to educate the people

XII. Science

Understandings concerning the ways in which the Mexican people deal with the natural forces in their environment serve as the basis for relating science content and experiences to this unit.

a. The surface features and location of Mexico determine the climate of certain regions.

Inspect rainfall maps and note areas of high rainfall.

Check location of large reservoirs for water storage and sites of hydroelectric plants. How are these locations related to the rainfall maps?

Compare the rainfall with that of your location, month by month.

How does rainfall compare throughout the year?

What are the main effects of this rainfall on Mexican life?

b. The Mexicans utilize their land resources intensively. Find out the size and population of Mexico and what proportion of the land can be farmed.

Read for information regarding farming techniques, including intensive cultivation, utilization of space by terracing and irrigation methods. Make drawings and models showing techniques.

Set up controlled plant experiments that show how use of fertilizers and plant chemicals stimulate plant growth.

c. Compare Mexico's petroleum and coal resources with the coal and petroleum resources of other countries of the world. Study the location of mountains, reservoirs and hydroelectric power sites.

d. The Mexican diet is influenced by the resources available to the people. Find out what staples make up the Mexican family diet and find out how these staples are obtained. Compare the diet of a Mexican child with that of an American child and find out how the former obtains his food.

e. Locate places in the world where there is a high incidence of earthquakes. Find out about the various types of earthquakes, involving horizontal or vertical shifts in the earth's surface.

Art and music activities have all ready been discussed throughout the context of this unit. Therefore, I have not separated these titles under separate (single) headings.

C. **Individual Activities**

I. Make a model of a farm or village explaining the buildings, animals and people. The following can be used in the construction:

hills and mountains— use clay, sand, and stones.

trees— use branches of real trees or crepe paper.

lakes streams, rivers, oceans—use blue paper or pieces of mirrors. For roads—use real dirt, sand or brown paper.

Houses and other buildings—use hay or straw for thatched roofs and clay.

People and animals—use small dolls, toys, clothes pins or wire covered with cotton or crepe paper.

II. Make a mobile of the products of Mexico.

III. Collect stamps of Mexico. Tell the significance of each. You might secialize in stamps, commemorating historical events or those depicting scenes, products or national heroes. You could compare and contrast stamps of Mexico to those of the United States.

IV. Dress dolls in their native costumes.

V. Make a booklet depicting the customs of Mexico.

VI. Make a booklet of poems or short stories about Mexican life, as a creative writing activity.

VII. Make models of the various types of homes seen in Mexico, using clay and straw pieces.

VIII. Show historical events of Mexico by displaying cutouts on a flannel board.

IX. Make a diorama. Use the open side of an empty box for the front stage. Place two pieces of a dowel in the box, allowing them to extend through two holes bored in the top of the box at each end and near the front. Tack a long strip of paper to these rollers. Draw pictures or paste Pictures found in magazines or travel guides on this strip. By turning the rollers extending above the box, the pictures can be reeled across the stage.

X. Make a descriptive pamphlet about Mexico which would serve as a good tourist guide.

XI. Make a calendar that shows a country's holidays. Tell why the day is commemorated.

XII. Make a cross-section map of Mexico, showing the surface elevation. Explain how people live at various altitudes.

XIII. Make a historical calendar for the year, showing dates of the birth of famous people, great happenings in science and history of Mexico.

XIV. Make slides of pictures or diagrams to be projected on a screen, depicting any aspect of Mexico which has been studied.

XV. Write articles on Mexico: education, industries and/or agricultural systems to be published in the school newspaper.

XVI. Write an alphabet story of the unit, beginning with "A" and using every letter of the alphabet. If possible, in an important statement such as "A" is for Adobe - sun baked bricks, made of mud and straw. They are used as building material in dry parts of Mexico.

"B" is for Brasero—a small metal charcoal-burning stove.

XVII. Write a group story, poem, play or song based on the Mexican content of the unit.

XVIII. Make a recipe file of Mexican foods.

XIX. Make a file box of pictures about Mexico, using newspapers, magazines and travel folders.

XX. Arrange an "Information, Please" program using information gained from outside reading.

Questions might be submitted by different members of the class.

D. **Culmination Activities**

I. Dramatize a group story of the unit for the school.

II. Share dramatic representation with another room.

III. Have a puppet show based on the unit.

IV. Have a fair in the classroom or playground with booths of the arts, crafts, fruits and foods and costumed dolls of Mexico.

V. Have a fiesta dinner in which the class prepares, cooks and serves the foods of Mexico.

VI. Have a parade of small, decorated floats showing the lives of the people of Mexico. Use wagons carts and soap boxes (racers).

VII. Have a story-telling party. The children tell legends about Mexico.

Using illustration, maps or objects to make their story-telling clear and interesting.

RESOURCES

Children's Bibliography

Amescua, C. C. (1962). *The Story of Pablo.* Encyclopedia Britannica Press.

Barlow, G. (1966). *Latin American Tales from the Pampas.* New York: Rand McNally.

Burke, M.S. (1941). *My Neighbor Mexico.* Michigan: Fideler Publishing.

Clarke, J. M. (1943). *Luis of Guadalajara.* California State Series, State Dept. of Education, Sacramento.

Coatsworth, E. (1961). *The Noble Doll.* New York: Viking.

Darbois, D. (1961). *Tacho, A Boy of Mexico.* Chicago: Follett.

Gartier, M. & Hall, G.H. (1962). *Understanding Mexico.* Illinois: Laldlaw Brothers.

Gual, E. (1955). *Torero, Bullfighter's Day.* New York: Coley Taylor.

Hammond, C. S. (1959). *The First Book Atlas.* New York: Franklin Watts.

Harbin, E. O. (1966). *Games of Many Nations.* New York: Abingdon Press.

Hitte, K. *Mexicali Soup.*

James, W. (1930). *The Adventures of Luisa in Mexico.* New York: E. P. Dutton and Company.

Littimore, E. F. *Mexican Bird.*

McNeer, M. Y. (1953). *The Mexican Story.* New York: Ariel Books.

Miller, N. (1965). *Children's Games from Many Lands.* New York: Friendship Press.

Moorhead, S. (1968). *If You Were Born in Mexico.* New York: Educational Reading Service.

Morrow, E. (1960). *The Painted Pig.* New York: Knopf.

Nackler, D. (1968). *How Maps and Globes Help Us.* Chicago: Benefic Press.

Peck, A. M. (1948). *Young Mexico.* Toronto: Dodd.

Quinn, V. (1943). *Picture Map Geography of Mexico, Central America and the West Indies.* New York: Lippincott.

Richard, J. A. *The Old Aztec Story Teller.*

Rinkoff, B. (1960). *A Map is a Picture.* New York: Thomas Y. Crowell.

Ross, P. F. (1952). *Made in Mexico.* New York: Knopf.

Ross, P. F. (1955). *Let's Read About Mexico.* New York: Fideler.

Sawyer, R. (1960). *The Year of the Christmas Dragon*. New York: Viking.

Stoker, K. U. (1947). *Under Mexican Skies*. Dallas: Bank, Upshaw and Company.

Teacher's Bibliography

Bernal, D. C. (1956). *Discovery and Conquest of Mexico.* New York: Farrar Strauss.

Brenner, A. & Leiahton, G.R. (1943). *The Wind That Swept Mexico.* New York: Harper and Brothers.

Cerwin, H. (1947). *These Are The Mexicans*. New York: Harcourt.

Cline, H. F. (1963). *The United States and Mexico.* New York: Atheneum.

Crow, J. (1957). *Mexico Today*. New York: Harper.

Epstein, S. & Epstein, B. (1967). *The First Book of Mexico.* New York: Franklin Watts.

Gallenkamp, C. (1959). *Maya*. New York: David McKay.

Glubok, S. (1968). *The Art of Ancient Mexico.* New York: Harper and Row.

Harding, B. (1934). *Phantom Crown*. New York: Bobbs Merrill.

Johnson, W. W. & the Editors of *Life*. Mexico. New York: Time, Inc.

Leon-Portilla, M. (1962). *The Broken Spears*. Boston: Beacon Press.

Lewis, O. (1959). *Five Families*. New York: Basic Books.

Lewis, O. (1961). *Life in a Mexican Village*. Illinois: University of Illinois Press.

McHenry, J. P. (1962). *A Short History of Mexico.* New York: Dolphin Books.

Parkes, H. B. (1950). *History of Mexico.* Boston: Houahton.

Prescott, W. H. (1957). *Conquest of Mexico.* New York: E. P. Dutton.

Roeder, R. (1947). *Juarez and His Mexico.* New York: Viking.

Simpson, L. B. (1952). *Many Mexicos*. California: University of California Press.

Strode, H. (1944). *Timeless Mexico.* New York: Harcourt.

Tannenbaum, F. (1950). *Mexico: The Struggle of Peace and Bread*. New York: Knopf.

Toor, F. (1960). *A Treasury of Mexican Folkways*. New York: Crown.

Turner, W. L. (1957). *Mexican Government Today*. Minnesota: University of Minnesota Press.

Vallant, G. C. (1956). *The Aztecs of Mexico*. England Pelican Pocket Books.

TRACING YOUR ROOTS

PROJECT SAGE

OVERVIEW

Tracing your roots, or family history, can open the doors to your past, helping you to understand what has shaped your present. In this unit, students will have the opportunity to research basic information about their relatives and ancestors, including maternal and paternal ancestors as well as parents. Enthusiastic students may be eager to search beyond that of their great grandparents. By doing research about the last three generations of their ancestors, students will be researching information about the last quarter of the 19th Century.

OBJECTIVES

- ☐ Students will trace significant events in parents', grandparents' and great grandparents' lives.
- ☐ Students will evaluate how ancestors and events and places in American history have affected family members' lives and beliefs.
- ☐ Students will plan and conduct interviews.
- ☐ Students will create a family tree and family time line.
- ☐ Students will make and edit tape recordings.
- ☐ Students will compose letters in order to obtain information.
- ☐ Students will organize and write an essay that states their major findings about their ancestors and reveals a theme or pattern inherent in their family-tree.

TRACING YOUR ROOTS

Procedure

1. Where do you start? To be successful in tracing your roots, you have to talk with people who have been associated with your family, and also talk with your relatives. Ask your parents to suggest people with whom you might communicate. Make a list of these people and include their addresses.

Your grandparents, if alive, can provide an enormous amount of information. Do not forget to list distant relatives.

2. When communicating with your relatives, use the telephone, write letters and make tape recordings.
    a. Explain the purpose of your project, and supply specific questions for them to answer.
    b. Arrange a specific time to meet with relatives who live close by. Interview these relatives in person. Attend your meeting equipped with paper, pencil and tape recorder. During or immediately after an interview, take brief notes and arrange them under subject headings .
    c. Send a list of questions to people whom you cannot contact personally.
    d. Share with your relatives the family tree chart to show one form of your final project. The chart might help to refresh a relative's memory.

3. As you gain information from letters, recordings and interviews, fill out your family tree and construct a family time line.

   Here are some suggestions for filling out your large family time line chart.

   a. Before beginning, cut strips of paper about one inch by 12 to 20 inches . Use each strip to represent an ancestor's life. (The strip's length will be determined by the ancestors life, for example: each inch should equal about five years, of an ancestor's life. Thus, an ancestor who lived 55 years would have a strip 11 inches long.)

   b. First use a pencil to record the information on the strips and then copy this information in ink onto new strips.

   c. Consider adding color to your chart by outlining different sets of ancestors' lives in different colors of ink. For example: paternal ancestors in red, maternal in blue.

   d. Move these strips around on the family tree line chart until you see how to position your ancestors' lives on the large chart's empty spaces.

   e. Glue these strips in place. (**NOTE**: If you print neatly and do not wish to paste strips of paper on your chart, simply draw in the boxes representing your ancestors' lives and fill in the information you have gathered.)

4. Your essay should reflect your family tree and family time line.

   a. Study your chart, notes and tape recordings. Look for a theme, or a unifying idea that occurs in many of your ancestors' lives. Organize your essay in such a way that you will communicate this theme.

   b. You might find it difficult to use all your notes. Therefore, make an outline that organizes your essay into sections, and plug in the most pertinent information.

   c. Do not forget to include yourself in your family story.

      Think about the following questions:

      Do I feel any pressure to "live up to" something that my family has believed in?

      When you examine your family tree, how do you feel?

   d. Do not forget to use your imagination! Think of an interesting and unusual title for your essay.

   e. Include, at appropriate places in your essay, photographs of relatives.

5. Share your findings with family members and classmates. Send a copy of your family story to as many family members as you think would enjoy having a copy. You will feel like a published author!

Resources

American Genealogical Research Institute Staff. *How to Trace Your Family Tree: Dolphin.*

Doane, G. H. *Searching For Your Ancestors: Bantam.*

Iredale, D. *Discovering Your Family Tree*: Shire Publications.

Rottenberg, D. *Finding Our Fathers*: Random House.

Watts, J., & David, A. F. *Generations: Your Family in American History*. New York: Alfred A. Knopf.

Questions to ask relatives.
1) Where were you born?
2) Which Ame
have you li
ugh?

QUESTIONS TO ASK YOUR ANCESTORS

NOTE: 42 questions is a great number of questions. Obviously you do not have to ask your ancestors to answer all these questions.

Immigration

1. Which of our ancestors was first to settle in North America? When did they settle there? Why did this person come here? (Answers to this last question will likely require hypothesizing.)
2. Has your family name been changed since your first ancestor came to America? If so, why? What is your feeling about such a change?

Migration and Community

3. How many times have you changed residences within this country?
4. What caused you to move each time?
5. Before you die, how many times do you plan to move and to where?
6. What size farms, towns, cities and suburbs have you lived in? Which living environment seemed most supportive of a humane life? of socio-economic advancement? of culture?

Race/Ethnic Group

7. To what race/ethnic group do you belong?
8. At what age did you become conscious of being a member of this group?
9. When other Americans think of your group, do they define it through skin color, religion, language, background or some other classification?
10. In what socio-economic group can most members of your family be found?

11. Has being a member of this group significantly influenced your life? If so, how?

Religion

12. Are you a member of a certain religious group?
13. If you do belong to a certain religious group, is it because of birth, conscious choice or both?
14. Did your parents' religious faith significantly influence your choices and your upbringing?
15. Has your religious faith ever caused you to be in conflict with the direction you have seen American life taking?

Economics

16. To which socio-economic class do you belong: upper? upper-middle? middle? lower middle? lower?
17. Have you always belonged to this class? If not, what caused the change?
18. Are you better off economically and socially than your parents?
19. Is your job satisfying? Why or why not?
20. Are you happy with our American economic system?

Government and Politics

21. When has government most directly touched your life?
22. Do you vote regularly?
23. Are you a dedicated member of any political party?

24. Which presidents during your lifetime have most captured your attention? Why?

Wars

25. Which American wars have you lived through? How intimately did any war touch your life?

26. Were you changed in any way as a result of this war?

27. Did you sense that America has changed significantly by any of its wars? If so, how?

Ancestry

28. How important to your personal identity are your ancestral roots?

Activities/Organizations

29. Are there clubs, organizations or other activities you have engaged in during your life that have been very important to you?

Education

30. Are you satisfied with your education? Why or why not?

Marriage

31. How did you meet the person you married? Were courtship patterns significantly different from what they are now?

32. Was your marriage in any way affected by historical forces (for example: the Great Depression of 1929-1941)?

33. Has your sexual role changed over time?

The Great Depression

34. How vividly can you remember the Great Depression of 1929-1941? What did you experience?

35. Some historians say the Great Depression was a trauma, that is, that it marked persons' lives so they thought and acted differently because of what they saw, heard or read. Was it a trauma for you?

Technology and Inventions

36. During your lifetime you have experienced new inventions and new technology (the automobile, radio, TV, motion pictures, computers, travel to the moon, etc.). Look at the 1860-1980 time-line chart. In what ways have people's lives been significantly changed by some of these inventions? Has our country improved because of these inventions?

Family Environment

37. While you were growing up, what size and kind of house did you live in? How many relatives lived either in the house or nearby?

38. Are you rearing (or did you rear) your children the way you were reared? If not, did historical forces cause the change?

39. Did most of your values come from those maintained by your family? From what sources do people obtain their values today?

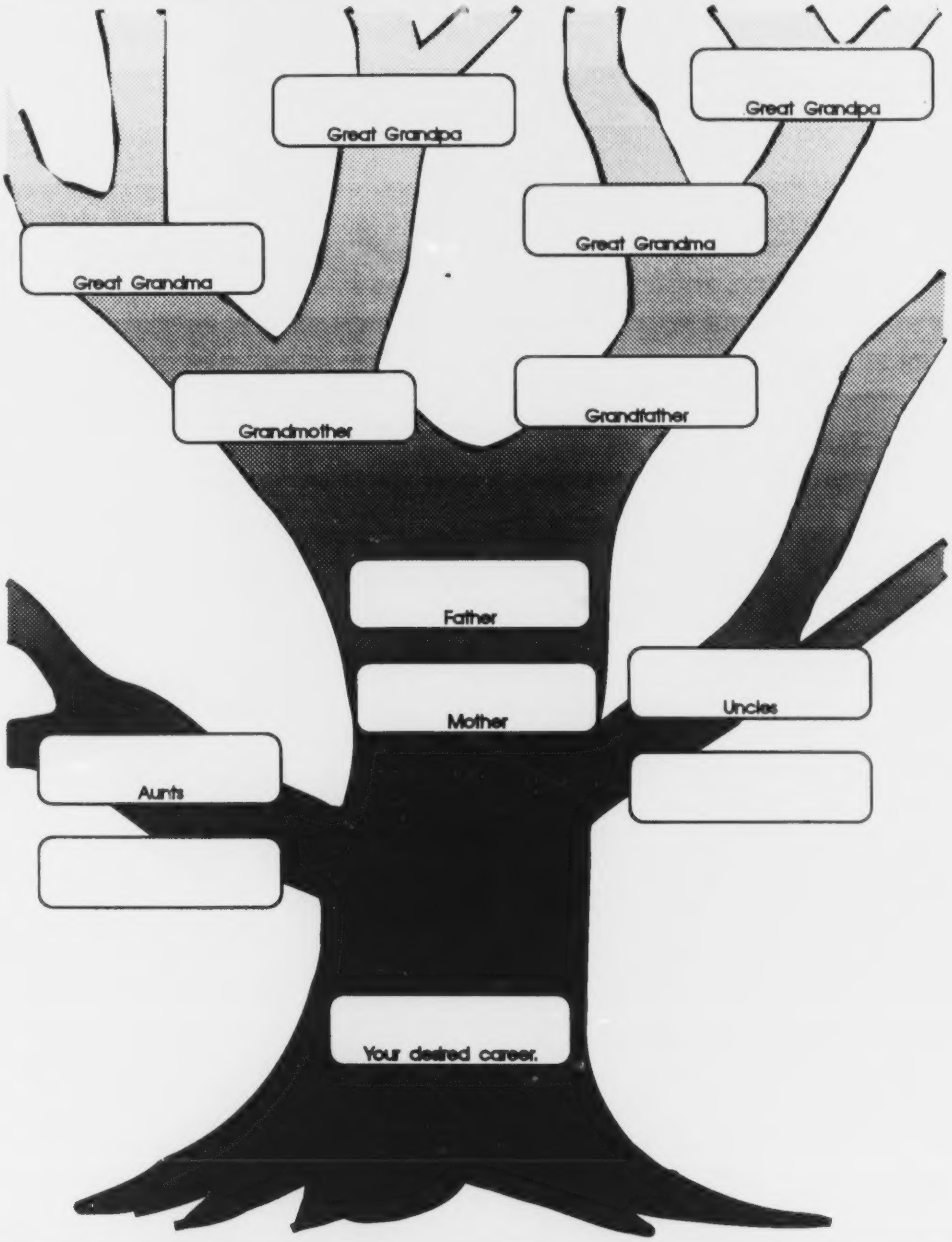
General

40. What has been the highlight of your life? What has been special?

41. Do you see any pattern, theme or meaning in our family tree?

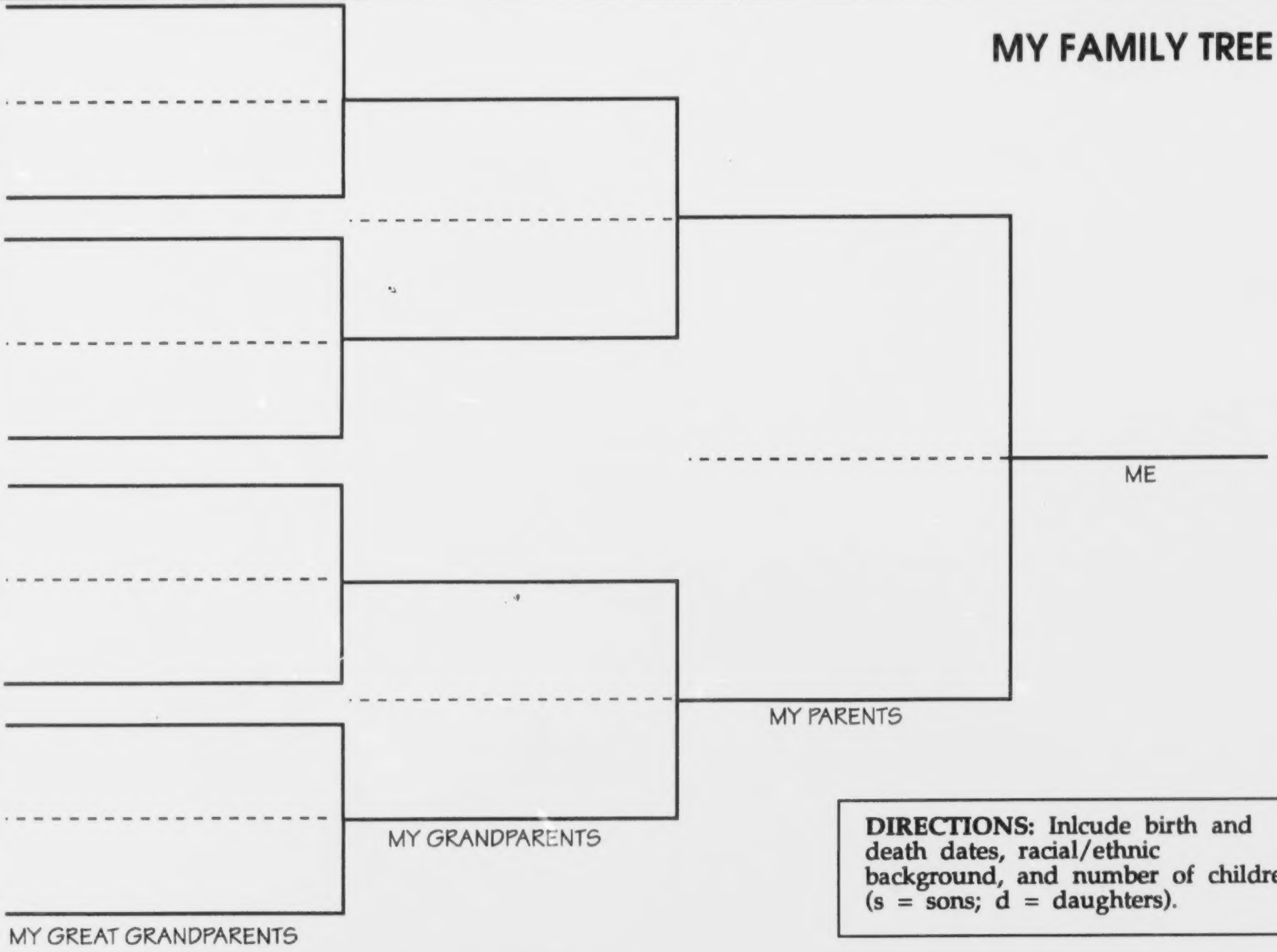
FAMILY CAREER TREE

Explore the occupations held by your family members. Complete the career tree by writing the appropriate jobs in the spaces below.


Great Grandpa
Great Grandpa
Great Grandma
Great Grandma
Grandmother
Grandfather
Father
Mother
Uncles
Aunts
Your desired career.

BEST COPY AVAILABLE

MY FAMILY TREE


ME
MY PARENTS
MY GRANDPARENTS
MY GREAT GRANDPARENTS

DIRECTIONS: Inlcude birth and death dates, racial/ethnic background, and number of children (s = sons; d = daughters).

THE RECORDING LOG

SIDE ONE			
Number Start	Number End	Interviewing	Notes/Comments

SIDE TWO			
Number Start	Number End	Interviewing	Notes/Comments

SEQUENCE OF SEARCH

NAME ____________________________

INFORMATION RECEIVED:

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NAME ____________________________

INFORMATION RECEIVED:

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A TRIP THROUGH THE TOMB

PROJECT SAGE

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SPECIAL NOTE

To present this unit in its entirety, the following materials are recommended for purchase.

-Mummy's Message
-Interact Co.
-P.O. Box 9610
-Phoenix, AZ 92040

OVERVIEW

A Trip Through A Tomb is a three-fold unit including:

- ☐ **Mummies Message:** A game which will introduce students to all aspects of Egyptian civilization.
- ☐ **Independent Research Study**: On the ancient burial procedures of Ancient Egyptian and Chinese cultures and a comparison of the cultural differences of the two civilizations.
- ☐ **Learning Center:** The learning center is made up of various learning activities, inter-disciplinary in nature dealing with the topics of: Pyramids, Trade and Transport, Art and Architecture, History.

These are culminating activities; the number to be completed is left to the discretion of the teacher.

INTRODUCTORY RESEARCH PROJECT

1. Map Work

A. Locate and label the following four ancient civilizations:

- Sumerians (Mesopotamia)
- Ancient Egypt
  (Nile Valley and Nile Delta)
- Ancient Greece
- Rome

B. Locate and label the following bodies of water:

- Nile River
- Tigris River
- Euphrates River
- Adriatic Sea
- Mediterranean Sea

2. Research Questions

A. What obvious natural resource do all four cultures share, according to your map work?

B. Why did these early civilizations all develop around the same natural resource?

C. What body of water has greatly affected the history of Ancient Egypt?

D. For how many miles does it flow?

E. What is this river's "claim to fame"?

F. What two seas influenced the people of Ancient Egypt?

G. List four or five geographical features which directly affect the way people live.

H. Specifically explain what these geographical features were like in ancient Egypt and how each affected the lives of the people who lived there.

I. What conclusions can one make about how the geography of the region affects how people live there?

A TRIP THROUGH A TOMB

PART ONE

In this section, students will assume the role of an archaeologist, taking part in an expedition into a pyramid. The expedition's goal is to advance to each of the three chambers within the pyramid. Students will make progress by correctly answering questions and collecting hieroglyphic cards as their expedition travels to each of the three chambers. In each of the three chambers, students will discover one of several pieces of a hieroglyphic tablet. Students must successfully piece together the hieroglyphic tablet and translate its message before completing the unit.

Students will be faced with many problems to solve. Pyramid builders created many traps or obstacles to confuse and frustrate grave robbers. The situations created on the problem cards are incidents actually encountered by archaeologists, as they explored historical pyramids.

Objectives

Students will:

- state that Egypt is located on the continent of Africa.
- identify some of the major geographical features and regions of ancient Egypt.
- explain that the natural environment where people live affects their progress.
- state some of the natural resources available to the ancient Egyptians.
- explain how man's quest to fulfill his basic needs eventually led to the formation of civilizations.
- explain why ancient Egypt was referred to as "The Gift of the Nile."
- state how and why writing was developed.
- define the term "hieroglyphics."
- explain the significance of the discovery of the Rosetta Stone to the study of Ancient Egypt.
- state how the Nile river greatly influenced the history of Ancient Egypt.
- state some of the customs of the Ancient Egyptians.
- explain the role of the pharaoh in Ancient Egyptian society. State some of the beliefs of the Ancient Egyptian religion.

- list several of the Ancient Egyptian contributions to civilization.
- explain the purpose of the pyramid.
- define the term *mummification*.
- explain the process of mummification.
- explain some features of the Ancient Egyptian government.

Skills

Students will:

- research various aspects of Ancient Egyptian culture.
- hypothesize about how natural factors affected the history of Ancient Egypt.
- draw conclusions about how the natural environment of an area affects the progress of a people.
- locate and label given information on a map.
- evaluate the significance of writing as it applies to the progress of a civilization.
- compare and contrast some of the customs of Ancient Egypt to the United States.
- make inferences about the role the pharaoh played in the government of Ancient Egypt.
- use research skills to piece together and translate the Mummy's Message.
- utilize decision-making skills.
- draw conclusions as to how the belief in the after-life structured the Ancient Egyptian life on earth.
- make generalizations about why writing was necessary for the progress of the Egyptian civilization.

Attitudes

Students will:

- become aware of the important role that ancient civilizations played in regard to their contributions to today's world.
- recognize the importance of each person's contribution to the group.
- recognize the importance of cooperation among group members when working toward a common goal.
- appreciate the Ancient Egyptian culture and its contributions to our world.
- become aware of and appreciate the work accomplished by archaeologists.

The "Center" will have a picture of a pyramid containing three chambers: the Queen's Burial Chamber, the King's Burial Chamber, the Great Hall or Gallery and passages leading to chambers. Activities for each chamber will be included as well as question cards, passage problem progress cards, hieroglyphic cards (discovery cards and passage progress card).

Rules

- Students cannot enter the pyramid until they have answered a question correctly.
- If the answer is correct, a marker is placed on the first block of any passageway chosen. This means that they have successfully entered the pyramid.
- After students have entered the pyramid, the same procedure is followed when answering questions, except for two additional steps. If the answer is correct, the student picks the top card from the Passage Progress Card deck to see how much progress was made. They will move either 1, 2 or 3 spaces. After the marker has been moved the appropriate number of spaces, a Hieroglyphic Card is taken and inspected by the student to note the information for solving the hieroglyphic tablet.
- Once inside the pyramid, students may select which of the three chambers they will enter first.
- Once in the interior corridor (the darker passageway), students can move markers in any direction.
- To enter the chamber the student must answer a question correctly and then select a Passage Progress Card, which will bring the student to the entrance of the chamber. The entrance block of the chamber is black, the same color as the interior of the chamber. The number may exceed the spaces needed to enter the chamber.
- Once a student has entered the chamber, he/she must successfully complete the activities listed. They must also receive an envelope, bearing the same symbols as the chamber just entered. The Discovery Card will indicate the number of hieroglyphic tablet pieces that they will receive.

- At this point the student may decide to begin piecing together and translating the discovered pieces of the Mummy's Message. The success at this task will depend upon whether the pieces will fit together and how many cards (hieroglyphic) have been gathered. HINT: To read the Mummy's Message, begin in the lower left-hand corner of the tablet and read each line from left to right.
- A student leaves the chamber by simply answering a question correctly, picking a Hieroglyphic Card, picking a Passage Progress Card and moving the marker the appropriate number of spaces.

- The above procedure is followed while entering the chambers. The last chamber cannot be entered until all the hieroglyphic cards are gathered. This can be done by answering questions and moving back and forth in the darker interior passage way.
- The black blocks on the exterior and interior passageway correspond to one of 24 problem cards. Students should try to stay away from these areas (traps).
- If a student lands on a black block, they must select a problem card and read the situation on the card. Another question card is then taken and answered. The situation will depend on whether the question is answered correctly.
- A student has completed his/her work when all questions are answered, when hieroglyphic cards are collected, and when all 15 pieces of the puzzle (tablet) are pieced together and translated correctly.

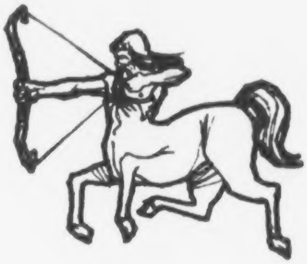
NOTE: Students will take part in this center in groups of two or more.

Queen's Burial Chamber Project

Assignment One

You are confronted with a task from the Queen's Burial Chamber. The topic you will be dealing with is Ancient Egyptian religion. You are to compile information on the different gods and goddesses present in Ancient Egypt. Do the following:

1. Make an archeological log or date book.
2. Rank the gods and goddesses in the order of their importance.
3. For each god or goddess, give the name, draw or photocopy a picture, give a brief description and tell what its function was.



Assignment Two

Draw pictures of a pyramid and a mummy. Present a written report explaining how both these pictures represent Ancient Egyptian religious belief.

Pharaoh's Burial Chamber Project

Assignment One

You are confronted with a task from the Pharaoh's Burial Chamber. The topic with which you will be dealing is government and law. You are to create a drawing which indicates the important place the Pharaoh had in Ancient Egyptian society.

Assignment Two

Create a chart showing the structure of government under the rule of the Pharaoh. Investigate what life was like under different Pharaohs.

Great Hall Chamber Project

Assignment One

You are confronted with a task from the Great Hall. The topic with which you will be dealing in this chamber is Ancient Egyptian contributions (i.e., inventions, writings, building, techniques). Choose one of the many contributions and make a drawing of that contribution. Along with this drawing write a brief report telling the contribution and why it was important to history.

Assignment Two

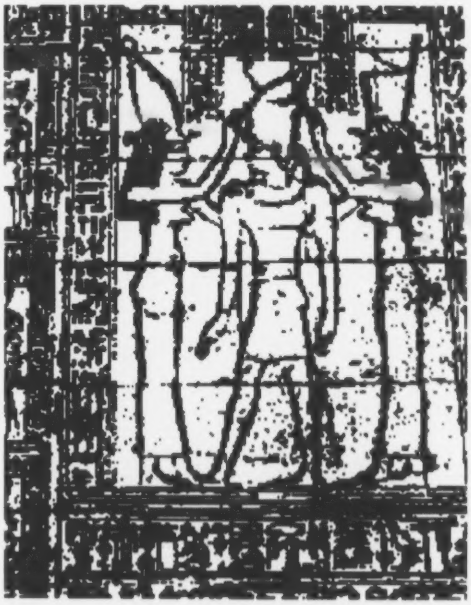
Make a chart that has the following headings:

-Contribution

-Description

-Significance

List the many contributions made and describe the significance of each.



PART TWO: Independent Research Study

Objectives

1. The children should suggest reasons for preserving the legacy of ancient civilizations (i.e., burial procedures) and compose questions about the need to preserve that legacy.
2. Students will define the terms *civilizations* and *burial procedures*.
3. Students will know the geographical location of both Egypt and China.
4. Students will become familiar with the history of the burial
5. Students will be able to set forth ways by which contemporary man can utilize the information gleaned from the study of ancient history.

After playing the Mummy's Message game, the students will have acquired sufficient background information about Egypt. The teacher should obtain a copy of *The Discovery of King Tut's Tomb,* distributed by Exxon Company.

Children should then use what they've learned about ancient Egypt and China to form theories that will explain the reasons why an ancient culture engages in certain types of burial procedures.

Research can be conducted in various ways: independently, groups and committee. Pertinent reference materials and resource tools should be made available.

Suggested resources are:

1. Library reference materials.
2. Textbooks about Ancient Egypt and China.
3. National Geographic magazine.
4. Museum staffs.
5. Community resources.
6. Films.

To achieve the stated objectives, each student should do one of the following activities and share his or her findings with the rest of the class so that all the students in the class will profit by each student's independent research.

Activities

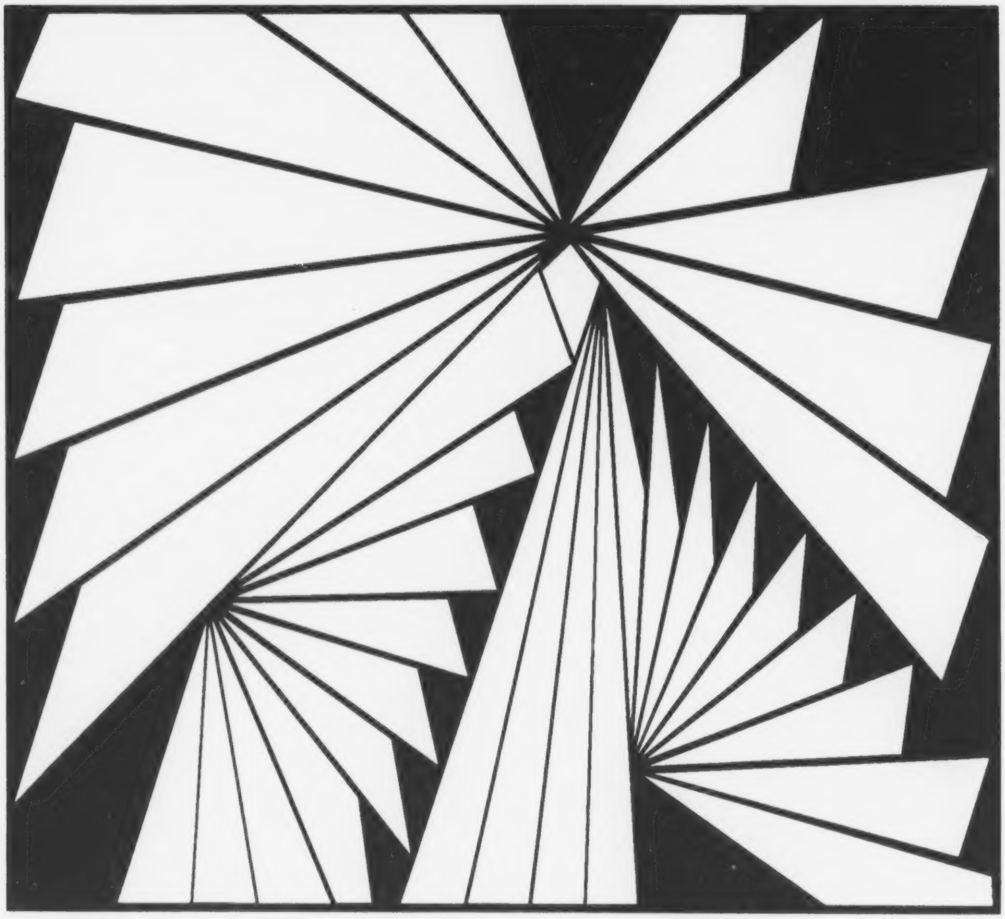
1. Research Ancient Egyptian and Chinese structures in existence today.
2. Do research about burial procedures, the purpose of a tomb, and the contents of a tomb.
3. Do research to determine how the geography of a country affects its cultural heritage and burial procedures.
4. If a tomb were to be built in the U.S., what would the design be? What would it contain? For whom would it be made?
5. Will the U.S. civilization flourish for as long as did the Ancient Egyptian or Chinese civilizations?

PART THREE: Learning Center

The learning center ia designed to provide hands-on experiences in the study of the ancient cultures. It is an opportunity for students to utilize their musical, artistic, writing, dramatic talents and have fun! Teacher's should decide the number of activities that students should complete, and consider the time students need to complete a given activity. Some activities take a longer time than others. Therefore, an individual contract should be employed.

- Write an editorial that describes the contents found in King Tut's toumb. Write a news article depicting the life of this great king.
- What are the qualifications for becoming a king? Can anyone become a king? Fill out an application and explain your qualifications.
- Write and present a skit about a journey that you've taken in a time machine back to Ancient Egypt or China. What did you see? Are the people different from people today? Describe their houses and clothing. How were the Pyramids and the Sphinx built? Compare living conditions then, with those of today.
- Write a myth to demonstrate your understanding of the values of Ancient Egypt and China.

CREATIVITY



PROJECT SAGE

DIFFERENT LETTER GROUPS

Each letter of the alphabet has a different shape. But some whole letters look alike, such as C and G, and others gave parts that are alike such as H and P, or I and T

> *In the sets of letters below, how many different groups can you make, with letters in each group alike in some way.*

A H V T C N

For example:

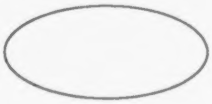
1. **H T N** (have up-and-down lines)
2. **A H N** (stand on two feet)

With the list below, make different groups, three letters each, that are alike in some way.

B H A O D V Y N
E J G I C P Q F
X N E H Z T L N
P G A T R K Z P

MAKING SOMETHING OUT OF IT

Below is a very simple figure. What different things could you make from it if you added something to it?



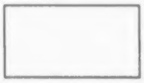
Here are a few things that could be made from this figure:

eye, ring, mouth, tin can, hamburger

The figure does not have to be an exact drawing of the thing you made from it. It may be only a part of the thing, as in the answers "tin can" and "cup."

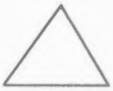
You do not have to draw the thing, just name it. But, you may draw it if you cannot think of its name.

First this:

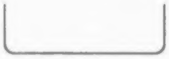


And then this:

First this:



And then this:



WRITING SENTENCES

Writing sentences is not a new task for you. But here you are asked to write sentences in a different way. In each task, you will be given five words. For example, the words:

TIM GUN MONKEY RIVER SCHOOL

Each sentence that you write should have in it two of these words.

Sentence examples:

- Tim was late for school.
- The monkey jumped into the river.
- The monkey's name was Tim.
- The gun was found in the river.

Rules to follow:

- Keep your sentences short.
- You may use three words in the same sentence.
- The statement does not need to be true.
- The sentence should make sense.
- Sentences can be funny.

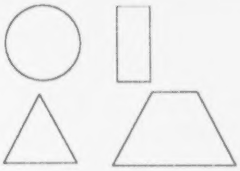
Write as many different sentences as you can, using two or three of these words in each sentence.

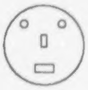
1. fire egg Jane paper street
2. duck fan desk candy man

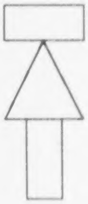
MAKING OBJECTS

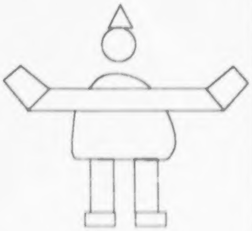
This is an activity of putting pieces together to make things. Look at the pictures below. The four given pieces are used to make three objects: a face, lamp, and clown.

Given pieces:





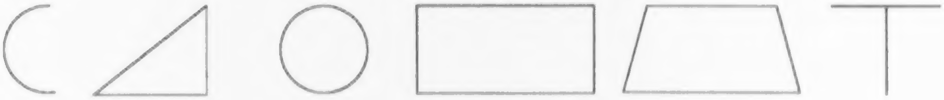




The rules of the game:

1. Use only the pieces given on each page. Do not add any other lines.
2. You may change the size of each piece, or turn it around, but do not change its shape.
3. You may use a piece as many times as you wish in making the same object.
4. You do not have to use all the pieces in the same object.

Using the figures below, make the objects listed using the above rules.



icecream cone
boy or girl
telephone
sailboat
woman's hat
steamship
rocking chair
wagon

SIMILAR MEANINGS

Many words mean about the same as other words. Here is an example:

What words mean about the same as "good?"

fine ______________________________

alright ______________________________

nice ______________________________

well-behaved ______________________________

What words mean about the same as:

fair ______________________________

punch ______________________________

sad ______________________________

speak ______________________________

WHAT TO DO WITH IT

Everything we see around us is useful for something. A frying pan is used for cooking; a bat is used for hitting a baseball; and a hat is (used) worn to protect your head.

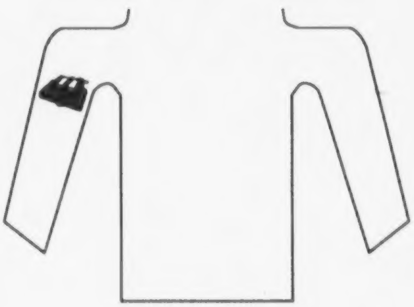
But each object can be used for something unusual. For example, a newspaper is used for reading, but it could be used to:

- start a fire
- wrap garbage
- kill flies or spiders
- keep rain off your head

What else could the these items (listed below) be used for? Give unusual uses, not common ones.

- A bed sheet is used as part of a bed.
- A shoe is used to wear on your foot.
- A rubber band is used for holding things together.
- A wooden pencil is used for writing or for drawing pictures.

KINDS OF PEOPLE



One day, some people from another planet landed on earth. Some earth people who were near them saw that these people wore a sign on their sleeve that showed the kind of work they did on their home planet. The things done there are like those done on earth. Here is one sign, a picture book:

When they saw this sign, the earth people gave these ideas:

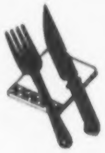
teacher, writer, student, singer

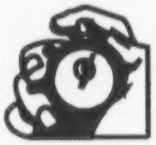
What other occupations could this symbol stand for? Write it on the line above.

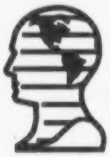
You might have said, book seller, or bookkeeper. Each kind of person should have his or her own kind of work or job.

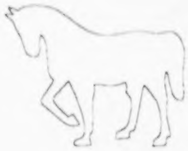
What kinds of people do the signs given below make you think of?

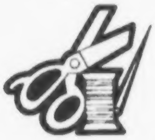
Write your ideas on the lines below each sign. Be sure to name kinds of people, with kinds of jobs. Do not just name objects.











NAMES FOR STORIES

Every story has a name or title that tells something about the story. Read the following story and think of titles for it.

One year the grain that was grown on farms near a village was spoiled. A wise old man told the people that if they ate bread made from it they would go crazy. They laughed at him, ate the bread anyway and all went crazy.

The old man was so different that they thought he should be locked up in a hospital. So he ate the bread, too, and became like the others.

Here are some names for this story:

- The town's people all went crazy.
- They did not take a wise man's advice.
- In a crazy town, act crazy.
- A town's health problems.
- The man who did not dare to be different.

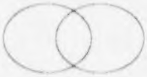
Write many titles for the following stories.

Story 1 Mr. John Fox had a vineyard of fine grapes, but animals that lived near by came to help themselves. John needed all the grapes to sell, so he built a high fence around his vineyard. Next year when the grapes were ripe, Mr. Reynard, the fox, came around expecting his usual feast. He jumped and jumped, but could not get over the fence. He turned away and was heard to say, "I don't want any of those grapes anyway; they are too sour for me."

Story 2 One day a red pony named Ruby wandered off into the woods and did not return. Several people who were fond of Ruby went in search of her. All of them gave up except a stupid boy named Randy, who came home leading Ruby. When asked how he found her, he said, "I just thought if I were a horse and got lost, where would I go? I went there and there she was."

CREATIVE DOODLING

Everyone likes to doodle. Different people draw different things. Complete the doodles below.



SUPPOSE YOU WERE . . .

Objectives

To let the students act like an object other than themselves and describe their feelings, attitudes, and concerns about their new roles.

Background

When children act as something other than themselves, they can often see their world from a whole new, creative point of view. The process of role playing and acting out is an excellent way for teachers to help children be the thing and act as the thing. Children may role play individually or with several people working together.

BE A MACHINE OR PART OF A MACHINE

Suppose you were the wheel on a roller skate.

What would make you feel good?

What wouldn't you like?

How would you feel if you belonged to a beginning skater?

How would you feel if you belonged to a professional skater?

BE AN OBJECT

Suppose you were a library book.

How would it feel if you got torn?

What wouldn't you like to see happen?

What would you like to happen?

Suppose you were an old can left out in the rain.

How would you feel?

What would you think?

Suppose you were a flag.

What flag would you be?

What would make you proud? Sad?

What sights have you seen?

BEING A PERSON

Suppose you were president.

What problems do you have?

What makes you angry, sad, happy?

What would you like people to understand that they don't seem to understand?

Suppose you were not liked by anyone in the class.

How would you feel about school?

How would you treat people?

How would you get other people to like you?

Suppose you were new in a school and couldn't speak the language that the other children spoke.

How would you feel?

How would you communicate?

PHOTOGRAPHY

PROJECT SAGE

OVERVIEW

Visual learning has always been important. With a camera in hand, students can go anywhere to observe anything. In a study of photography, many types of learning, besides that of visual learning, take place. Many of the skills of photography are like those employed by various other professionals. These skills are like those employed by a scientists: measuring, estimating, analyzing, comparing and speculating about possibilities; or like those employed by a chef: weighing, stirring, mixing, timing and combining; or like those employed by others such as a mathematician, a critic, an observer, a commentator or an artist.

In this unit, students will have the opportunity to observe, research, hypothesize, analyze, compare, draw inferences, experiment and create while studying the following topics:

- Experimenting with Light
- Exploring the Camera
- Light-sensitive Papers/Film
- Chemical Magic/Developing Film

OBJECTIVES

☐ Students will think of words that contain the words *photo* and *graph*.

☐ Students will conduct experiments in order to investigate ways to bend light beams and send them off in a different direction.

☐ Students will compare the camera to the human eye.

☐ Students will conduct experiments using different types of lens in order to draw conclusions about its function.

☐ Students will explore cameras, observing their construction, parts and function.

☐ Students will design their own cameras after determining what parts are essential to the camera.

☐ Students will chart results of photographs taken, considering such variables as time of exposure, types of sunlight, size of pinhole and distance between pinhole and film.

☐ Students will observe film under the microscope to determine the parts of the film.

☐ Students will experiment with various types of light-sensitive papers to determine how film reacts when exposed to natural and unnatural light.

☐ Students will apply developer solution to photographic paper and hypothesize what happened and why it happened.

☐ Students will mix chemicals needed to develop photographs, applying mathematical skills.

INTRODUCTION

What does the word *photograph* mean?

Begin the unit by having students investigate the etymology of photography. The word has two parts:

Photo means light.

Graph means picture.

Therefore, *photograph* means light picture.

Have students think of all the words that have either the word *photo* or *graph* in them. Display many reference books to aid students in listing words. Challenge students by organizing teams. The team that composes the longest list wins!

EXPERIMENTING WITH LIGHT

Background Information

Light is a kind of energy like heat, electricity and gasoline. Energy can do work for us; heat makes our food hot; electricity can make a fan move, and gasoline can make a car go.

Light is a form of energy that you can see. Light makes an image on film the picture of a subject. Without light, no pictures can be taken. To capture light, we have to rely on the following sources:

- the sun and sky (daylight)
- photo-flood bulbs or photo-lamps (light bulbs)
- flash bulbs and flash cubes

Experimentation

If light travels in a straight line, how does light help you to see a picture? The following activities assist students in exploring ways to bend light beams and send that light off in a different direction (maybe straight to the camera).

BEAM PUZZLES

Materials

- Light source
- Slide with opening
- Mirrors
- Pattern cards
- Clay

Problem Can you make light beams follow patterns?

Starters Using the beam patterns on the following pages, try to make your light beams follow the patterns?

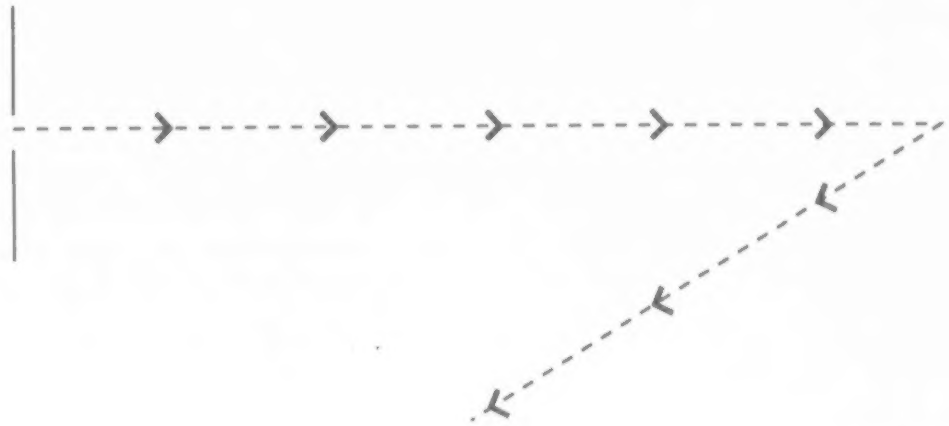
If you use blobs of clay smooshed onto the corners of the mirrors and the slide, they will stand up wherever you want them.

We found that setting the light source directly behind the opening in the slide gave the strongest beam of light. Can you bounce the beam off the mirrors to follow the paths of the arrows?

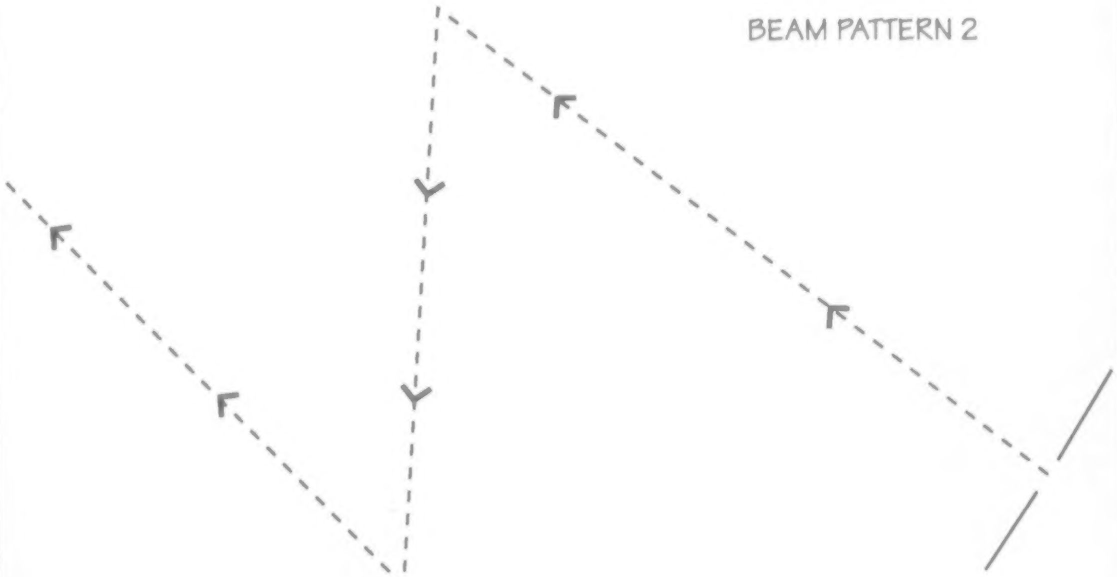
What Else? Try to design a beam puzzle for someone else to follow? If you used a larger light source and a large piece of cardboard with a slit, could you make a king-sized beam puzzle?

Does it make a difference if the room is darkened?

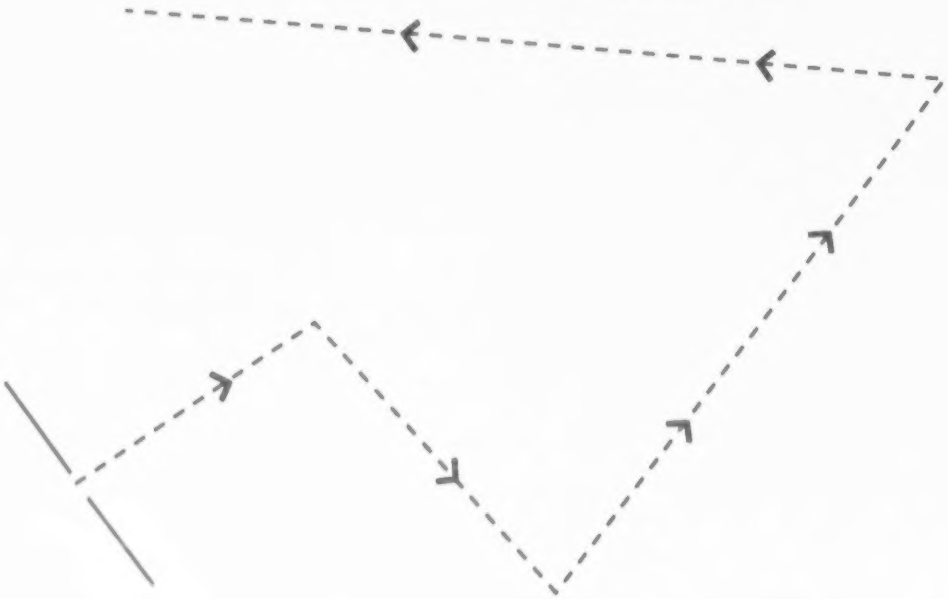
BEAM PATTERN 1



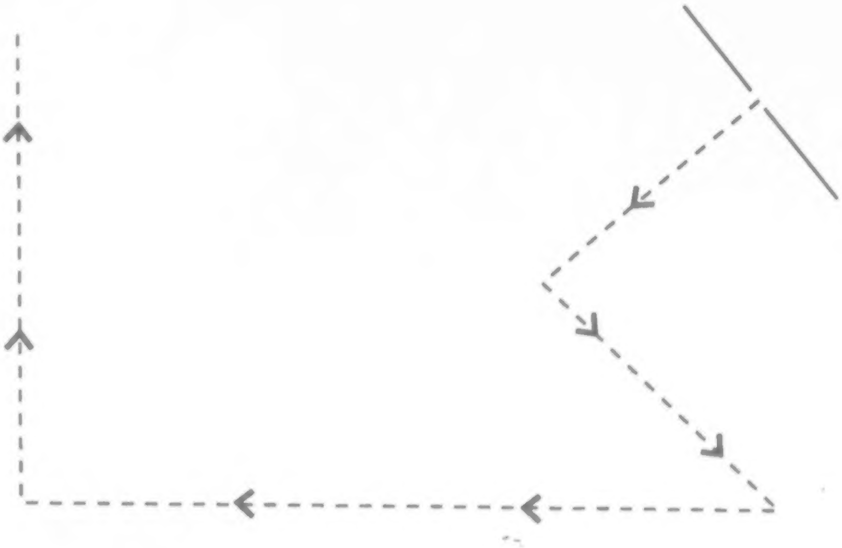
BEAM PATTERN 2



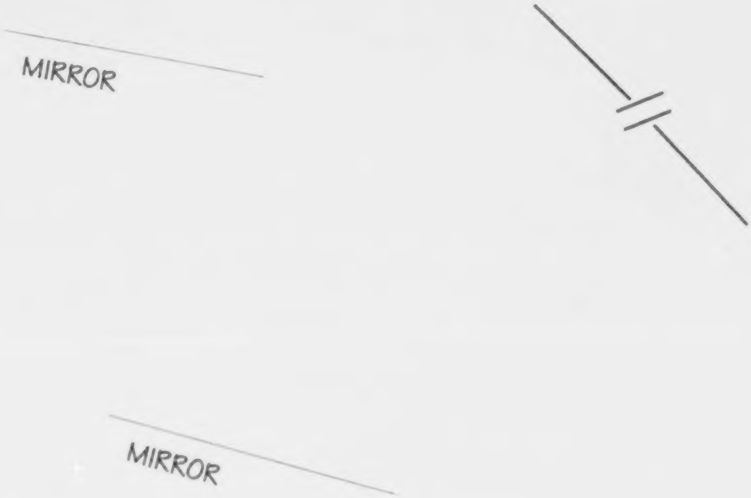
BEAM PATTERN 3



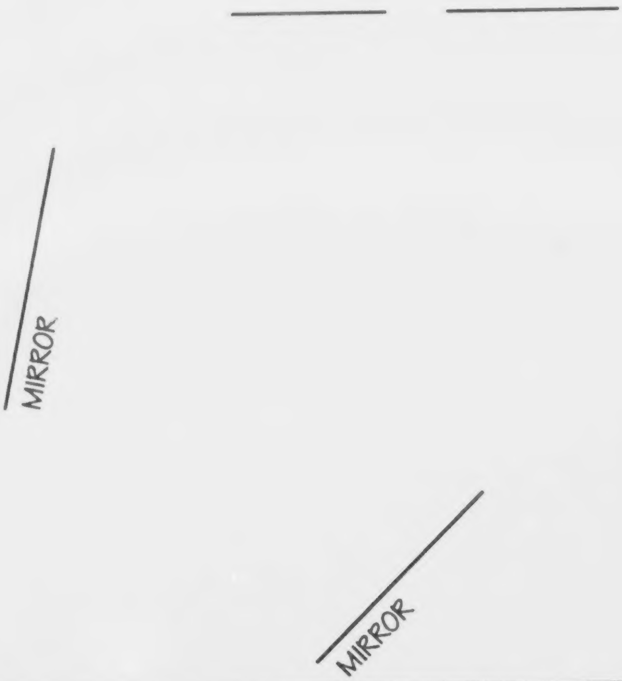
BEAM PATTERN 4



BEAM PUZZLE 1


MIRROR
MIRROR

BEAM PUZZLE 2


MIRROR
MIRROR

BOTTLE BOGGLER

Materials

Plastic pill bottle with lid
Printed material
Water

Problem

Can you use a bottle of water to make things look larger?

Starters

Fill the pill bottle with water so there is absolutely no air in it? Replace the cap tightly. (Leaks are messy.)

If you lay the bottle on its side over the printed words and look through it, what do you see?

Can you move the bottle so the words look shorter?

Can you make them look taller?

If you take off the lid and pour out a little of the water, you will have a bubble when you lay it back on its side.

Does this change the way the print looks?

What Else?

If you add some food coloring to the water in the bottle and look at some colored pictures, will they change in appearance?

Can you make parts of the pictures seem to disappear with colored water?

What happens if you try this with a bigger bottle?

Does the shape of the bottle make a difference?

Can you think of some different liquids to try in place of the water? List some of them here and then try them.

LIQUID LENS

Materials

Styrofoam cup
Plastic wrap
Rubber band
Focus design disc
Water

Problem

Can you use water as a magnifier?

Starters

If you cut a small opening at the bottom of the styrofoam cup, it will be easier to slide things in and out of your magnifier.

Stretch plastic wrap loosely across the top of the cup and keep it in place with a rubber band. Carefully pour water on top of the plastic wrap. Slide any of the focus design discs through the opening in the bottom of the cup. You might find some other things to use for viewing instead of the discs.

What Else?

If you make the plastic looser so it will hold more water, does it change the image?

If you pull the plastic tighter and use less water, will it make a difference?

Can you find out the name given to a lens that is shaped like your water magnifier?

If you put colored water in the magnifier and put colored pictures in the viewer, do some colors change? Vanish?

If you find any leaves or insects around, they can be put into the magnifier for closer examination, too.

If you try liquids other than water in the plastic wrap, does it make a difference?

List some of the liquids you could try.

WILL IT?

Materials

Page containing Master Shape and Mystery Shapes
Mirror
Pencil

Problem

Since a mirror just sits, wouldn't you think it would be predictable?

Do you really know what a mirror can do to something?

The first part of this problem is to learn how well you can predict what a mirror will do.

Starters

On the following page, you will find the Master Shape. This is the key to all the other strange looking shapes on the rest of the page.

Using only the mirror and the Master Shape, how many of these shapes do you think you can duplicate exactly?

Do not touch that mirror yet!

Before you try each one, predict! Each shape has a prediction line next to it. Write your prediction — Yes (I can make this shape with the Master Shape and the mirror) or No (It cannot be done).

Now, use the mirror.

Move it in any position near the Master Shape to get the results you want.

Write the results of your testing on the test line next to each shape. How many of your predictions were correct? Were you surprised by any of the results?

What Else?

Now you are ready to create your own Master Shape.

Does adding a design (like our squares) make it more difficult?

Make a page of mystery shapes and challenge others to predict and test.

How well can they do?

PRISMS

Materials

Mirror
Glass of water
Sheet of white paper

Problem

How can you make your own prism to show the colors of the spectrum?

Starters

If you place the mirror in a glass of water, you can bend rays of sunlight to show the spectrum.

Where would be the best place to set the glass? Is the mirror facing the sun?

If the paper is used as your screen to reflect the spectrum, what is the best position for your paper?

What colors can you see?

Using crayons, colored markers or colored pencils, can you duplicate the spectrum on paper?

What Else?

If you tap the glass of water lightly, what happens?

If you use a regular light bulb instead of sunlight, will the spectrum appear? Is it as clear as it was in the sunlight?

How about trying the beam from a flashlight?

Using two mirrors, can you reflect the spectrum from one mirror to the other?

MIRROR MESSAGES

Materials

Mirror
Pencil
Paper

Problem

Can you use a mirror to help you design a clever, secret code?

Starters

All you need is a clue; then you are on your own with this one.

If you get the mirror in the right place, these strange symbols will become a boy's name.

DUD

How many other letters can be coded this way?

Can you write a message to be read in mirror code?

What letters cannot be coded like this? Why not?

What Else?

How many words can you think of that can be used to send messages in mirror code?

LEMON LENS

Materials

Gelatin (directions on package)
Cardboard
Newspaper
Plastic Wrap

Problem

What is the best possible lens you can make from lemon gelatin?

Starters

We found that making the gelatin and chilling it for about two hours made it firm for this.

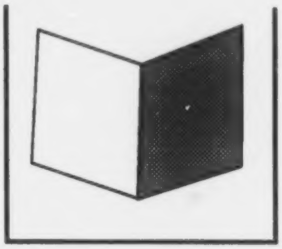
While it is setting, you can cut the newspaper to fit the cardboard square. Cover newspaper and cardboard with plastic wrap, folding it over the cardboard and taping it tightly on the back. This makes a durable, cleanable surface for trying out your lenses.

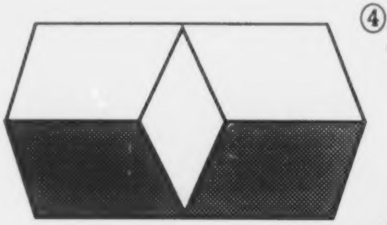
When the gelatin is firm enough to pick up with your fingers, you are ready for action.

Break it apart any way you would like. Try all different shapes and sizes. How do different shapes affect the print on your newspaper? When you think you have a good magnifying lens, share your discovery with someone else. (Do not let them eat it!) What is it about your lens that makes it a good magnifier?

What Else?

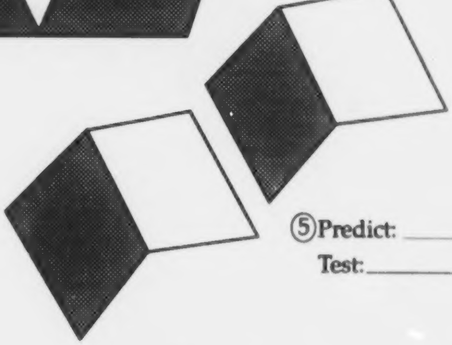
What if you try other flavors? Do you suppose you could make a pair of edible spectacles? Can you use your lens to concentrate the sun's rays before it melts? If it melts and you re-chill it, is it still a good lens?





④**Predict:** ________

Test: ________

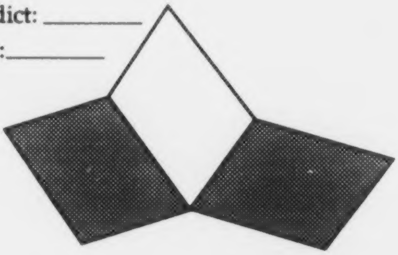


⑤**Predict:** ________

Test: ________

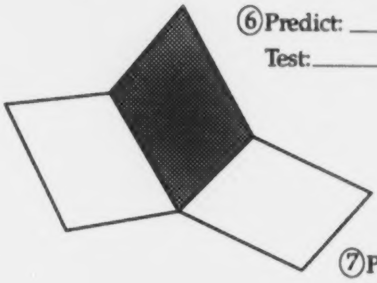
①**Predict:** ________

Test: ________



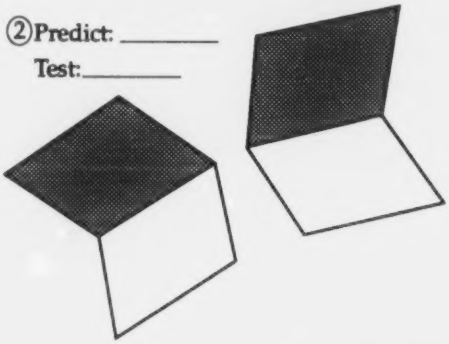
⑥**Predict:** ________

Test: ________



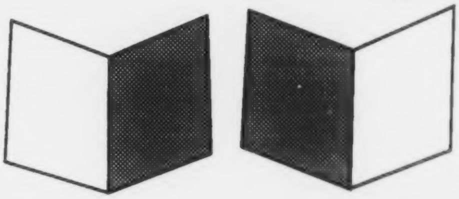
②**Predict:** ________

Test: ________



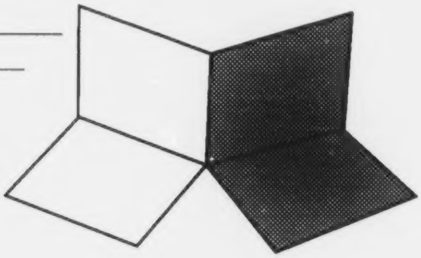
⑦**Predict:** ________

Test: ________



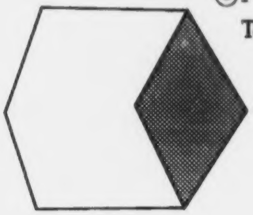
③**Predict:** ________

Test: ________



⑧**Predict:** ________

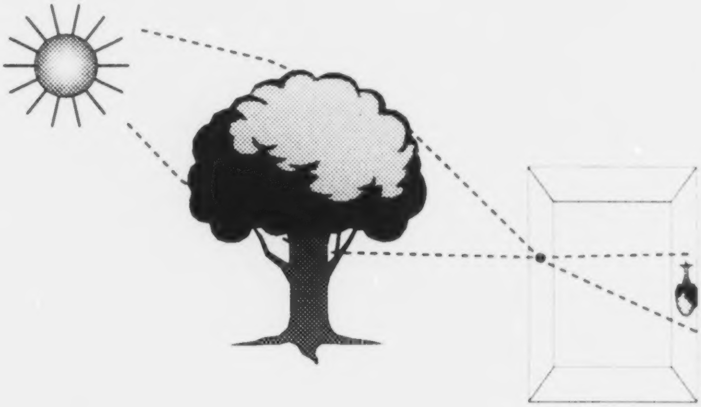
Test: ________



EXPLORING THE CAMERA

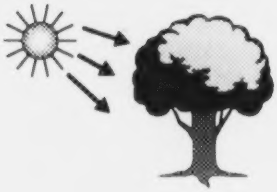
Background Information

The first camera was the "camera obscura" which literally translated means "darkroom." It was first discovered during the Renaissance, that by drilling a hole in a wall of a darkened room, what was outside of the room would be projected onto the opposite wall of the dark room as a perfectly detailed, inverted (upside-down) image (picture). People first began tracing the image onto paper, and it was only a matter of time before light-sensitive materials were discovered that would capture the image on the paper and, smaller more portable variations of the camera were invented.

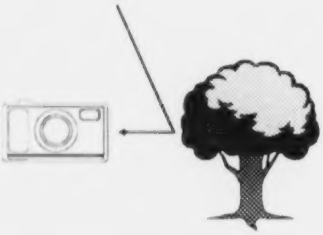


How the Camera Works

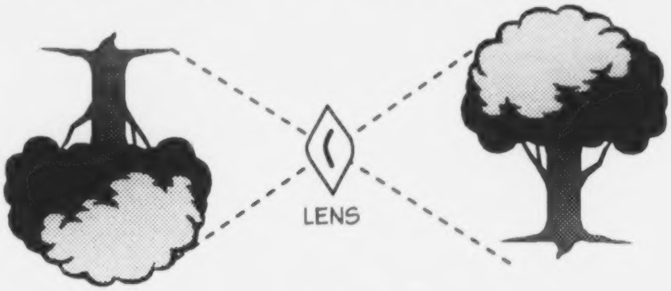
1. The object that one takes a picture of is being struck by light rays from the sun or an artificial light source such as a light bulb or flash.



2. Some of the light is reflected from the object through the lens of the camera.



3. The lens bends these light rays so they meet to form an image on the film that is just like the object photographed. The image forms on the film.



4. The shutter and the diaphragm on a camera control the amount of light which enters the camera. The shutter controls the length of time light enters the camera, and the diaphragm controls the size of the lens opening.

EXPLORING THE CAMERA: Activities

Comparison

1. How is the camera like the human eye? Have students compare the camera and the eye, listing similarities that can be made. Encourage students to draw direct and indirect relationships between the two objects. To aid students, have models of both the camera and the human eye on display.

2. The Lens: The lens is one of the most important parts of the camera because it brings reflected light rays into focus to form an image. Anything transparent and evenly curved, acts as a lens.

   Experiment: Have students put a drop of water on waxed paper that has been placed over a textured object such as a piece of fabric.

   a. How has the textured object changed?

   b. What is the cause of this change?

3. A lens forms an image:

   Experiment: Have students sit across the room from a window and with their backs to the window, hold a magnifying glass in one hand and a piece of white paper in the other. Have them move the glass back and forth until they see an image on the paper. When the image on the paper is sharp and clear, the distance between the lens and the paper is the focal length of that particular lens. Draw a conclusion as to why the distance between the lens and paper (or film) is important.

4. Pinhole Camera Project

   A. First give students the opportunity to explore cameras, observing the camera, construction, its parts and function.

   B. Have students design their own cameras, or they may wish to use the pinhole camera directions supplied in this section. Students must first devise a plan (blueprint), illustrating how their camera will look as well as the steps (directions) for construction. Students must determine what parts are essential to a camera.

C. After constructing their cameras, have students experiment with and chart results with such variables as time of exposure, types of sunlight (bright sun, overcast, etc.), size of pinhole and distance between pinhole and film. (Worksheet included.)

D. Discuss results, both successful and not, and why students feel that these results occurred.

PINHOLE CAMERA DIRECTIONS

All you need is "Quick Quaker Oats" container, metal foil, black tape, black paint, straight pins, light-sensitive paper, a cardboard cutter and developing chemicals. Here is what to do:

1. Paint the inside of the box black.
2. When it is dry, cut a small square section out of one end and tape a piece of metal foil over it.
3. With a straight pin, carefully poke a hole through the center of the piece of foil.
4. Make a "lens cap" with a small piece of oaktag. Tape the oaktag over the foil on the top only. You can lift this up to let light in, and close it again after taking you picture.
5. Go into the darkroom to tape a piece of photographic paper inside the box opposite the pinhole. Make sure the light-sensitive (shiny) side is facing the pinhole.
6. Seal the box with the black tape, and you are ready to take a picture.

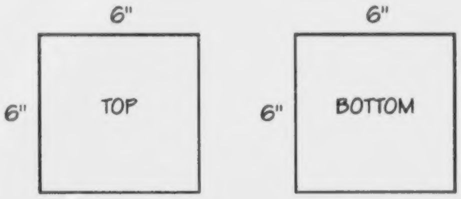
HOW TO MAKE A PINHOLE CAMERA

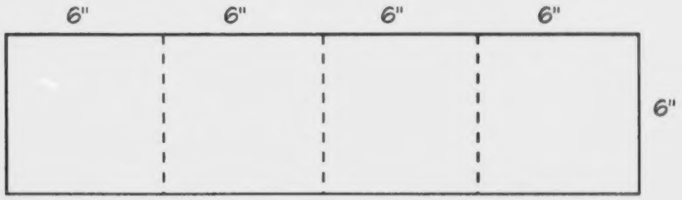
MATERIALS

- rigid cardboard-black on one side, if possible; if not, use black paint for the inside of the camera
- black tape
- #10 sewing needle
- Exacto knife
- ruler
- film-Tri X Pan (fast black and white) 4x5"
- aluminum foil
- glue

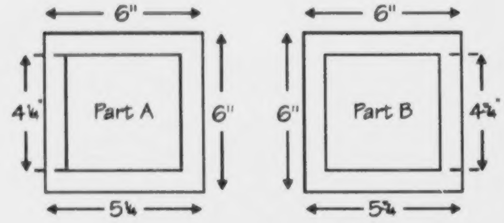
When constructing the camera always have the black side of the cardboard facing the inside of the camera.

1. Find a box about 6"x 6"x 6" and paint the inside black. Or make a box about 6" square out of the cardboard, with a backdoor that opens.
Use Exacto knife to score cardboard where it will fold.

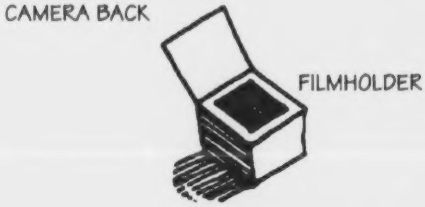




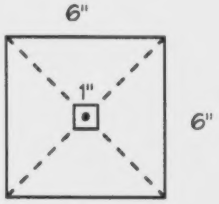
2. To make the filmholder, glue together the two film holder frames made as illustrated, outside edges together, and with Part A over Part B.



3. Open back door of the camera and tape filmholder to back of the camera. Part A of the holder faces out and Part B of the holder faces inside the camera.

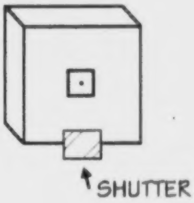


4. In front end of camera, cut out a 1" square exactly in the center. With black tape, tape a piece of aluminum foil over the hole on the inside of the camera. Pierce the center of the aluminum foil with the needle to about halfway up the shank.



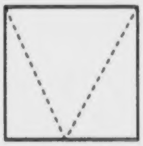
BEST COPY AVAILABLE

5. Make a shutter by placing a 3" square of cardboard over the foil. Use tape as a hinge.



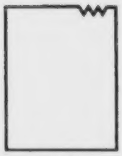
6. With a flashlight or light bulb, check the camera for any light leaks. It is extremely important that there are none. Also, check to see that everything inside the camera is black.

7. On top of the camera, draw two lines to make a view finder.



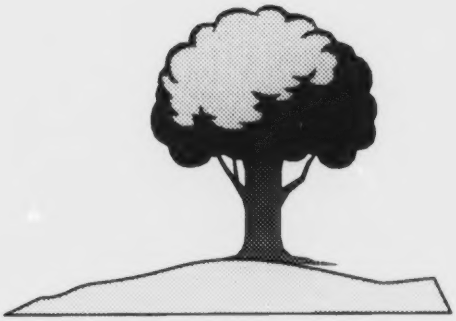
TOP VIEW

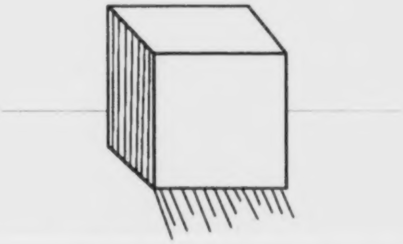
8. Load the camera in absolute darkness. Use a dark room or a change bag (available at camera shops). Be sure notches in film are at upper left-hand side of camera. (This tells you that the correct side of the film is facing front.)



FILM

9. Take pictures by lowering the shutter. In bright light with Tri X Pan, ___ 1-2 seconds exposure, and in bright overcast weather try 3-4 seconds. Keep the camera perfectly steady. Still lifes and landscapes make good subjects.





10. Unload camera in complete darkness. Keep exposed film in a light-proof box and have it developed.* Be sure to tell the person developing the film how it was taken.

* We tried developing our own film. However, because we were beginners at both making the camera and developing the film, we found that sending in our film to be developed commercially gave better results.

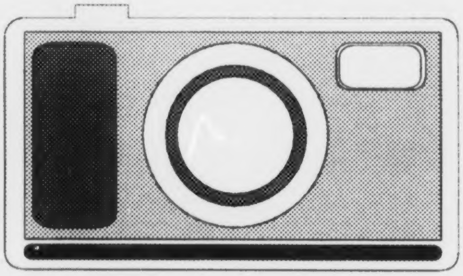
HOW TO TAKE A PICTURE

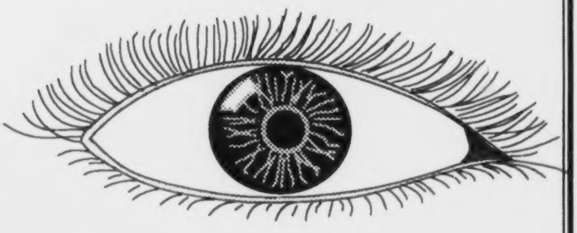
1. Place the box in front of your subject — preferably an immobile one (an object that is not moving). A good idea is to place a book or small rock on top of the box to steady it.
2. Gently lift up the tape covering the pinhole (or the oaktag flap), thereby exposing the paper to the light.
3. The average length of exposure is about 30 seconds. You will have to experiment to be sure of the appropriate timing.
4. Return to the darkroom to develop, stop, fix and rinse what will turn out to be the negative image.
5. You can get a "positive" by placing your paper negative on top of another piece of photographic paper, exposing them both to the light, and developing the second piece of paper in the same way as the first.

CHART YOUR RESULTS

Picture Number/ Image Taken	Time of Exposure	Type of Sunlight	Size of Pinhole	Distance Between Pinhole & Film

HOW IS THE CAMER LIKE THE HUMAN EYE?



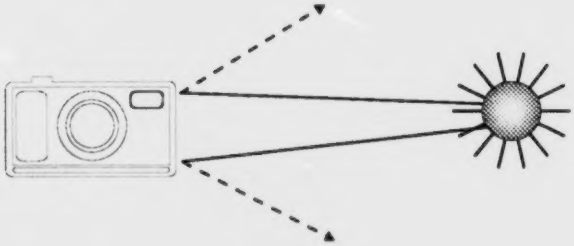


LET'S REVIEW

Do you remember what the camera parts do?

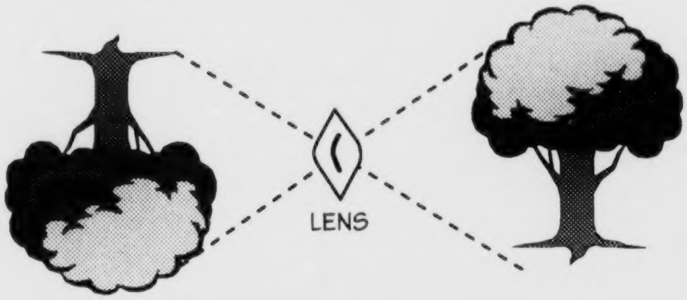
1. *lightproof* box

Keeps light away from the film.



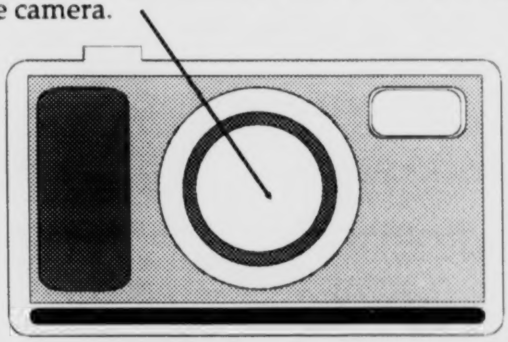
2. *lens*

Focuses the image inside the camera.



3. *lens opening*

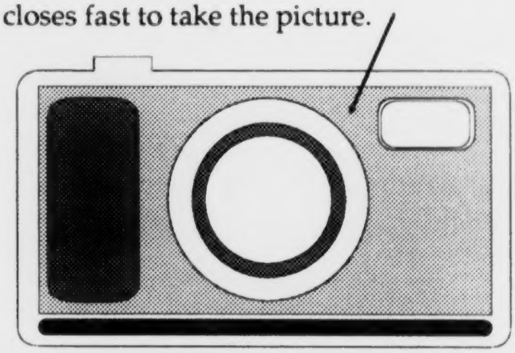
The size of the opening behind the lens where the light goes into the camera.



4. *shutter*

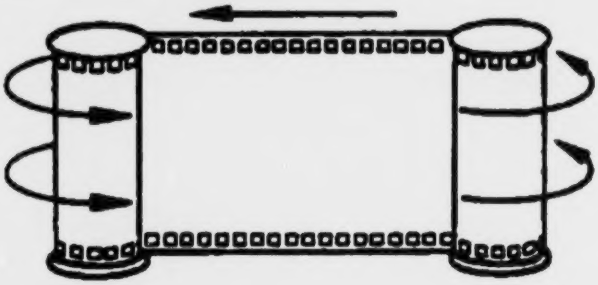
Covers the lens opening.

Opens and closes fast to take the picture.



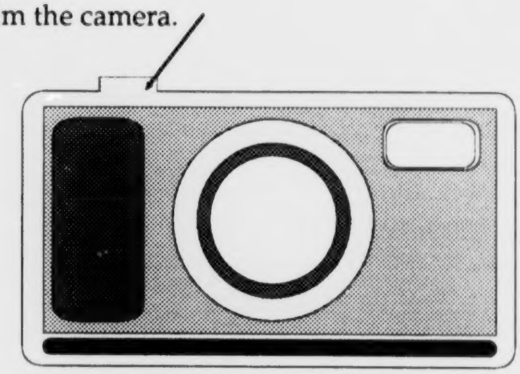
5. *film advance*

Moves the film in the camera.



6. *viewfinder*

Helps to aim the camera.

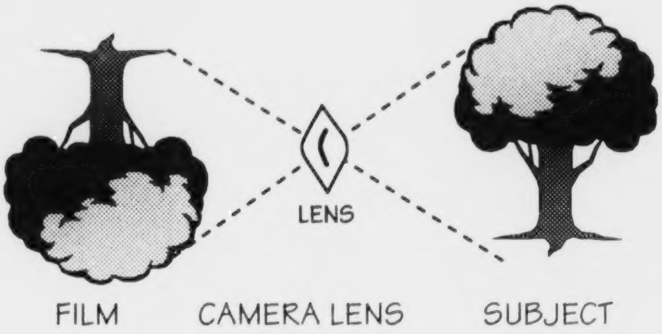


LIGHT-SENSITIVE PAPERS/FILM

Background Information

Film is a transparent plastic or paper material which has been coated with an emulsion, containing silver compounds. Film is light-sensitive. When struck by light, the silver compounds undergo a chemical change. The change creates a latent image on the film, which cannot be seen until the film is developed.

With no light on the film, the film is gray. Light makes an image of the subject on the film, inside the camera.



The parts of the subject that are bright become dark in the film. The parts of the subject that are dark become bright in the film.

Emulsion

The emulsion is the top part of the film. The picture taken is in the emulsion. The emulsion is made of silver, gelatin and chemicals. If light shines on the emulsion, it becomes dark when it is developed. Emulsion is very thin. Therefore, if you tried to lift or bend it, the emulsion would tear and bend. The base of the film (made out of paper or plastic) holds the emulsion, so it will not tear or bend. The emulsion becomes the picture, while the base holds the emulsion so it can become the picture.

LIGHT-SENSITIVE PAPERS/FILM Activities

1. Have students explain how the taking of a picture is like making a footprint in the sand. (worksheet)

2. Have students observe a piece of film under a microscope. Using the highest magnification possible, investigate the two parts of the film:

   A. emulsion

   B. base

   Students should illustrate their findings.

3. Printing:

   The following activities will assist students in discovering how various types of film (light-sensitive paper) react when exposed to natural and unnatural light.

   A. Photograms

      1. Kodacrome paper

      2. Studio proof paper

   B. Diaza Art

   C. Printing with Repro-negative paper

   D. Printing with Blueprint paper

HOW IS TAKING A PICTURE LIKE A FOOTPRINT IN THE SAND?

WITH A KEEN EYE . . .

Observe a piece of film under a picroscope. Try to identify the emulsion and base of the film. Illustrate your findings below.

CAMERA-LESS PICTURES

Photograms

A photogram is a photograph made without a negative.

Studio Proof Photography Paper is the name of the paper we will use to make photograms. It is not like ordinary photography paper that is extremely sensitive to light. Studio paper takes longer to develop, which makes it easier to work with. This paper is fully developed when it turns a deep plum color. After development, you must fix it in the fixer solution or your photo will fade.

Experiment

Use objects with unusual shapes.

Use 3-dimensional objects.

Use many objects.

Overlap objects.

Background Information

To make a photogram, one exposes an arrangement of objects on photographic paper and then develops the expossure. When the photogram is put in the developer, the area where the objects were placed will remain white while the background will turn black. The finished photogram is striking with the contrast of white on black.

Materials

(The first seven items are available at photographic supply stores.)

developer (any standard black and white —such as Versatol, a liquid form, or Dektol, a powder substance. Versatol is slightly more expensive than Dektol but a little easier to use.)

stop bath

fixer

high contrast paper #4, 5, or 6 (the higher the number, the greater the contrast)

3 pairs of tongs — one for the developer, one for the fixer and another for the stop bath. (Plastic or glass household containers can be used for trays.)

3 trays

3 trays

safe light (A yellow light is recommended on the back of packages of photographic papers but red can also be used.) A safe light may be purchased or made. To make one, simply buy a 25-watt yellow light bulb and screw it into the socket of a portable, hand-carried lamp.

paper towels; water in a sink; bucket, or tub; nature objects (leaves, flowers, etc.); small junk objects which should be flat (otherwise, the photogram will blur)—buttons, paper clips, washers, rubber bands, coins

construction paper

Directions For The Teacher

Before you begin this lesson, mix developer, stop bath and fixer according to directions on the respective bottles. Pour the three solutions into three separate trays. Provide a pair of tongs for each tray. Get water ready in bucket, sink or tub to rinse completed photograms. Now students may begin their photograms. Interesting arrangements can be created with a variety of materials. On a blank sheet of paper, have each student try one of the following ideas:

Instructions

1. Collect leaves and/or flowers. Arrange them to make a nature scene.
2. Choose small pieces of junk to make an interesting design. (Make sure whatever objects chosen are flat.)
3. Cut out designs or pictures from construction paper. Arrange them as you like.
4. Try any combination of the above.

When they are satisfied with their arrangements, students bring them to you.

You are now ready to begin the development process.

1. You will need to work in a dark room of some sort. (A closet or any small room without windows is good.)
2. Turn on the safe light when you enter the darkroom.
3. Take out one piece of high contrast paper and carefully tape the package closed so that remaining pieces will not get exposed.
4. Have the students, one at a time, arrange their objects on the high contrast paper, shiny side up, on the floor directly under the area where the light socket is, so that when light is turned on the photogram will get maximum exposure. Note: If you do have access to an enlarger, objects can be arranged on the easel and then exposed to light.
5. Turn on the overhead light. Expose the photogram for about 30 seconds.
6. After exposure, turn off the overhead light and with the developer tongs, gently immerse the photogram in the developer. When your image is the way you want it (25 seconds to one minute), take it out of the developer.
7. With tongs, transfer the photogram to the stop bath. Leave for about 15-30 seconds.
8. Transfer the photogram from the stop bath to the fixer. Leave for two minutes.
9. Put the photogram in the water for about 30 minutes to rinse off chemicals.
10. Blot photogram between paper towels. Allow to dry overnight with heavy book on top of it.

DIAZO ART

Background Information

The word "diazo" refers to a special type of light-sensitive paper which can be exposed by means of the sun's rays, and developed by ammonia fumes. Because Diazo Art requires no special darkroom or chemicals (other than ammonia fumes), it is perfect as an introduction to other lessons included in this unit. As they experiment with Diazo Art, students will begin to see what the development process means and how it works.

Materials

Diazo paper (available at most photographic supply stores)
pencils
construction paper and/or tissue paper
scissors
ammonia bottle*

***Getting the ammonia bottle ready**

Pour a small amount of ammonia (enough to cover the bottom) into any bottle large enough to hold the size of Diazo paper your students will be working with. Place a sponge (diameter of sponge should be same as that of the bottle) on the bottom of the ammonia bottle. Pour in more ammonia until the sponge floats on top of it. There should be no ammonia above the sponge level or it will get the Diazo paper wet when placed in the bottle. Your ammonia bottle must have a tight fitting lid so ammonia fumes cannot escape. Suggestion: an aquarium can be used.

Instructions

1. With a pencil, draw a picture of a simple object on construction and/or tissue paper. One large object usually works better than several small objects. Example: vase of flowers.
2. Cut out your picture.
3. Take a piece of Diazo paper from its black package. (Carefully tape the package shut.) Place your picture on the yellow side of the Diazo paper.
4. Walk outside and lay the combined papers on the ground, thus exposing your picture to the sun.

5. When the Diazo paper turns white, it is time to bring it inside. (How long this takes will depend on the day's weather; the sunnier it is, the faster the Diazo paper will turn white.)

6. Remove the picture from the Diazo paper and place the Diazo paper in the ammonia bottle. (No more than two or three papers should be in the bottle at the same time.) Do not press the paper against the wet sponge.

7. When the image on the Diazo paper appears and is dark enough, take it out of the ammonia bottle.

8. Frame your picture to provide contrast.

PRINTING WITH STUDIO PROOF PAPER

To print one negative at a time:

Materials

glass sandwich
sheet of Studio Proof paper
scissors
negatives
working solution of fixer (room temperature) (optional)
rinse water (room temperature) (optional)

Instructions

1. Indoors, away from sunlight, cut a square of Studio Proof paper, slightly larger than the size of a negative. Keep the Studio Proof paper you are not using, covered and away from light.

2. Open the glass sandwich and place the square of Studio Proof paper on the cardboard, shiny side up. Look carefully at your negative to find the shiny side. Place the negative on the Studio Proof paper, so the shiny side is up. Close the glass.

3. Expose this to the sun, so the light shines through the negative onto the paper. Generally 10-20 seconds of exposure in bright sunlight is adequate. When the edges of the paper turn dark purple, the print should be ready. After exposure you can look at the paper and immediately see your print. This print will darken if left in the light.

4. If you want to make the print permanent, dip it into a working solution of fixer and then rinse it in water. This will lighten the print. If dipping the print in fixer lightens it too much, make another print, but increase the time that the print is exposed to light to compensate for the fading that occurs.

   NOTE: If the print is too light, extend the time the print is exposed to sunlight. If the print is too dark, shorten the time the print is exposed to sunlight.

PRINTING WITH REPRO-NEGATIVE PAPER

To print one negative at a time:

Materials	glass sandwich sheet of Repro-Negative paper 1 pail working solution developer (room temp.) 1 pail working solution fixer (room temp.) 2 pails water cardboard trays or newspaper scissors negatives sunshine

Instructions

1. Indoors, away from sunlight, cut a square of Repro-Negative paper slightly larger than the size of a negative. Keep the paper you are not using covered and away from light.

2. Open the glass sandwich and place the square of Repro-Negative paper so the shiny side is up. Look carefully at your negative to find the shiny side. Place the negative on the Repro-Negative paper, so the shiny side is up. Close the glass.

3. Hold the sandwich so the light can get to it until you are consciously making the exposure. When you make the exposure, let sunlight shine through the negative onto the paper for only about half a second.

4. After exposure, dip the Repro-Negative paper into the developer until you see the print appear. When the image has developed to your satisfaction, remove from the developer, rinse in water and then in fixer. Finally, rinse in water for a few seconds and dry in a paper towel.

   NOTE: If print is too light, extend the time the print is exposed to sunlight, or extend the time in the developer. If the print is too dark, shorten the time it is in the developer. Exposure time is largely a matter of a trial and error. This paper is extremely sensitive to sunlight, compared to blueprint and Studio Proof paper.

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PRINTING WITH BLUEPRINT PAPER

To print one print at a time:

Materials

Glass sandwich
sheet of blueprint paper
about 1/2 cup 3% hydrogen peroxide
Two - 5-quart pails about half full of water (room temp.)
cardboard trays
scissors
negatives
sunshine

Instructions

1. Add the peroxide to the water in one of the pails and stir. Set the two pails next to one another on trays and label them.

2. Indoors, away from sunlight, cut a square of blueprint paper slightly larger than the size of a negative. Keep the blueprint paper you are using covered and away from light.

3. Open the glass sandwich and put the square of blueprint paper on the cardboard, blue side up. Look carefully at your negative to find the shiny side. Place the negative on the blueprint paper, so the shiny side is up. Close the glass.

4. Expose this to the sun, so light shines through the negative onto the blueprint paper. About one minute of exposure in bright sunlight is adequate. The edges of the paper will fade.

5. After exposure, dip the blueprint paper in the diluted solution of hydrogen peroxide and water. Your print should appear immediately. Dip the print into the pail of water for a few seconds. Put the complete print on a paper towel to dry.

   NOTE: 1 part of 3% hydrogen peroxide to 8 parts of water is about right for this solution.

   If the print is too light, extend the time the print is exposed to sunlight. If the print is too dark, shorten the time the print is exposed. The lighter the edge gets, the darker your final print will be.

CHEMICAL MAGIC: Developing Film/Processing

Background Information

To process film means to change film into pictures. Processing film means developing.

If You Have Darkroom Facilities

1. The exposed film is taken into a darkroom, so when the roll or cartridge containing the film is opened, there is no light to further expose the film and ruin it.

2. The film is first put into a developing solution which contains chemicals that make the latent image visible by darkening the silver compounds in areas that have been struck by light rays.

3. The acid film is next put into a weak acid solution called stop bath, which prevents it from developing any further.

4. The film is then put into a fixing solution, which removes undeveloped silver compounds. The film is then washed to remove the fixing bath chemicals and dried.

If You Do Not Have Darkroom Facilities

Getting the film into the tank for one roll of film at a time:

Materials

black bag
string
developing tank
lid
metal weight
lasagna (plastic apron)
masking tape

Instructions

1. Place developing tank, lid, metal weight, lasagna and your roll of film in the bag. Put an arm into each end of the bag and have someone tie the bag above your elbows with a piece of string. Be sure the cloth is gathered carefully under the string and that the string is snug enough that no light can enter the bag.

2. When you are all tied up, break the seal on the film and unroll it to the point where the film is attached to the wrapper. Tear the film free and separate it from the wrapper. Starting at the looped end of the lasagna, insert one end of the film and roll the lasagna and unroll the film at the same time, so that the two are rolled together like a jelly roll. Place the "jelly roll" in the tank, put the metal weight on top of it and fit the lid on the tank.

3. Have someone untie you. Take the loaded tank from the bag and secure the lid with masking tape.

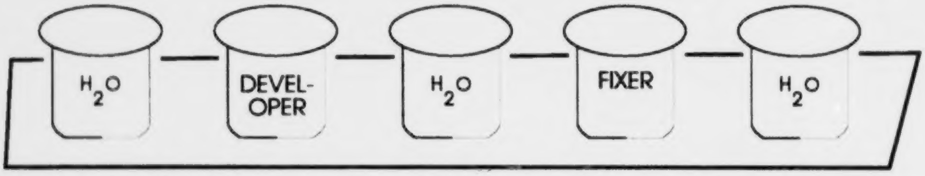
4. Check in the bag to be sure the paper wrapper is there and not in your tank. If you have rolled the paper up and not the film, then your film has probably been exposed to light and will not develop. If both the paper and the film are in the tank, go back into the bag and separate them.

PROCESSING FILM IN THE CLASSROOM: Without A Darkroom

Developing film is not really complicated but can be hectic if you have your whole class doing it at once. If you can schedule groups of eight to ten students at a time, you will find organization is not a problem. If you only have one period and want to get as many rolls of film developed as possible, read through the following suggestions before beginning.

Before the class begins, have the room completely set up. Students can mix the chemicals the day before. You will need one pail of a working solution of developer and another pail of a working solution of fixer. Four pails should be filled with water. Label the pails, so there will be no confusion and leave them on a table until the next day. The developer should be covered with plastic wrap; the fixer and water does not need to be covered. Hang up a length of string like a clothesline and put clothespins on it (about 2 per roll of film).

On the day of the developing, put the black bags, the tanks, a ball of string and some scissors in one area of the room and set the pails on cardboard trays or newspapers. Place the pails on a table so they can be reached from both sides. Pails should be ordered like this:



A bucket of water should be near the clothesline with two sponges in it. These are for wiping off the wet negatives.

Pinch paper or plastic cups to form pouting spouts and float one in each pail. Write timing instructions on the board or the trays under each bucket, so you do not have to repeat directions.

At the beginning of the class, open a roll of film and show the class how to roll the film up in the lasagna. Anyone who wants to practice can then use the open film. To have time, you might have everyone practice this once the day before.

You will probably not have enough bags and tanks for everyone. If you have more than seven, you might consider setting up two rows of pails for developing. You will make good use of what tanks and bags you have if the class works in pairs. One person on each team can develop and the other can assist the first time around. Those developing, put the film in the tanks, their partners can help tie them into the black bags. One of them should tape the top on the tank. The person developing goes down the row of pails filling and shaking while the assistant keeps track of time. When the first roll is hung up to dry, the partners can switch jobs and develop the second roll of film.

Dry the lasagna before reusing it. The tanks do not need to be dried, but should be drained, As soon as you have a group of expert film developers among your students, the experts can help others. In no time your whole class will be experts, and future film developing sessions can be informal, with small groups working on their own.

When you clean-up, pails containing developer and fixer should be rinsed thoroughly, as should the tank and all its parts. Table or desk tops should be wiped with a damp sponge because fixer forms a white powder if allowed to dry without being wiped.

If you do not develop more than 20 rolls of film at a session, you can keep the mixed chemicals for a day or two and use them again. Developer will only keep if it is tightly covered and kept in a cool place.

NOTE: Wring sponges out and place one against each side of the negatives. With one end of the negatives attached to the clothesline, you can pull the sponges down and wipe both sides of the negative at once.

NOTE: A dye on the film will probably turn the first rinse green right away. Do not worry about this. Water in the pails should be changed after about ten rolls of film have been developed.

CHEMICAL MAGIC—Developing Film/Processing: Activities

1. Photographic Painting (type attached)
2. Mixing Chemicals:

   Have students mix the chemicals needed for developing film. If only a portion of chemicals are needed, students will have to apply mathematical skills to determine exact amounts needed.
3. Students can experiment further with developing film in the activities provided in the film section of this unit.

Photographic Painting

Photographic painting is a technique which involves painting photographic paper with photographic chemicals. It requires no darkroom and can be carried out with an entire classroom. After students try the technique, inquiry discussions can be held by discussing the question: "What happened and why?"

Background Information

As soon as the light-sensitive photographic paper is taken out of its envelope, the entire paper is exposed by the room light. When designs are painted on the paper with developer, just those parts of the paper that contain developer are developed. The paper is then put into stop bath and fixer to stop the action of the developer. These painted, developed areas will be gray or black, depending on the length of time the developer was on, and the unpainted parts will be white.

Materials

developer - any standard black and white - such as Versatol or Dektol (Versatol is slightly more expensive but easier to use.)
fixer
stop bath
2 standard developing trays for fixer and stop bath
2 tongs
photographic paper (glossy)
measuring cup or graduated cylinder
3 dark bottles with lids to store extra solution
sink with running water
assortment of: brushes, pens, cotton swabs objects to print with

such as string, jar lids, etc.
1 small paper cup per student

Procedure

1. Prepare developer according to directions on the container.
2. Mix stop bath and fixer. Pour each into a developing tray.
3. Take out photographic paper and with brush or other object dipped in developer begin painting and printing on the shiny side of the photographic paper. Here is where your creativity comes into play.
4. Using tongs, dip paper into Stop bath for 15-30 seconds.
5. Put paper into fixer for 10 minutes.
6. Put paper in sink with cool, running water for 1 hour.
7. Blot with paper towels.

PINHOLE CAMERA

Background Information

This project provided an excellent opportunity for problem-solving if students design their own pinhole cameras. However, it is a difficult project, and some students will experience failure. Therefore, it is up to the discretion of the teacher as to whether the students design their own cameras or follow directions given in this unit. When a child designs and builds a camera, and it works, a thrilling experience results.

Suggestions for Teaching Students

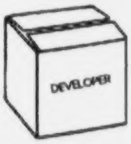
1. For explanations and suggestions concerning cameras and films, refer to the beginning of this photography unit.
2. Let the students explore some cameras first.
3. Discuss camera parts, and their function.
4. Ask students to design their own camera (or to follow directions on how to make a camera) and talk with them about how they are going to do it and what parts are essential to a camera.
5. Give a minimum amount of *how-to* directions if they are designing their own camera. However, guided discussions will be absolutely necessary throughout, to avoid complete frustration.
6. Have students experiment with and write down results with such variables as time of exposure, types of sunlight (bright sun, overcast, etc.), size of pinhole and film.
7. When finished, discuss results, successful or not, and why students think these results occurred.

LOOKING BACK

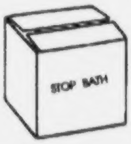
Let's look at some of the different things the photo processing laboratory does to your film.

There are five basic steps to processing black and white film.

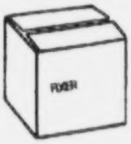
The steps are:



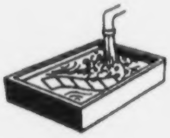
STEP ONE



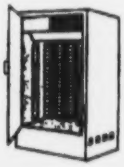
STEP TWO



STEP THREE

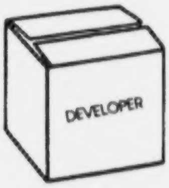


STEP FOUR
(Wash)

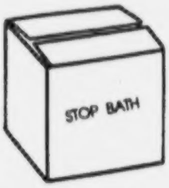


STEP FIVE
(Dry)

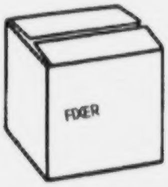
The first three steps use special chemicals. The steps are:



STEP ONE

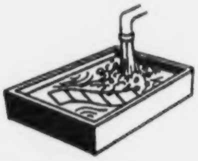


STEP TWO

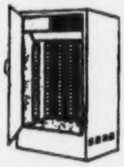


STEP THREE

Steps four and five do not use special chemicals. They are:



STEP FOUR
(Wash)



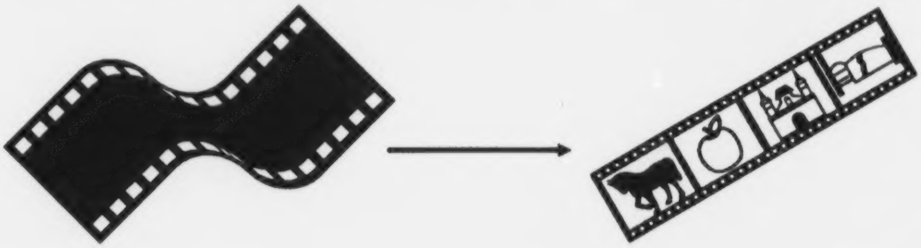
STEP FIVE
(Dry)

Wash is water. It is used to wash the chemicals off the film.

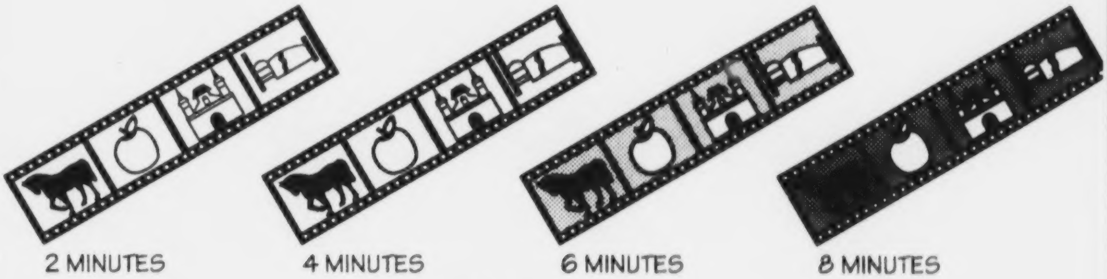
After the film is washed it must be dried.

DEVELOPER

The developer solution changes the invisible picture into a black and white negative.



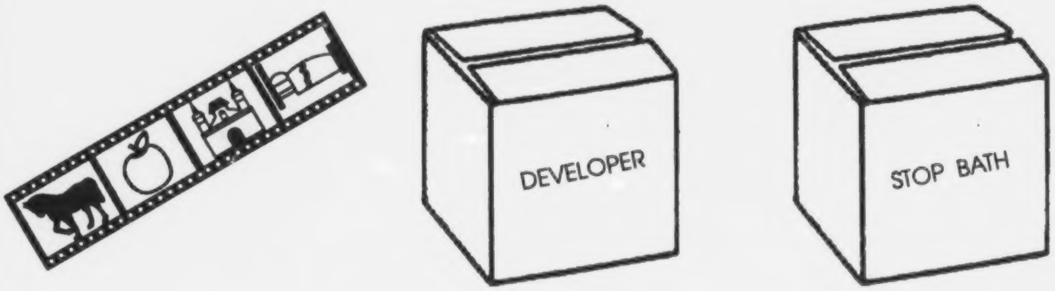
The longer the film is in the developer, the darker the film will get.


2 MINUTES
4 MINUTES
6 MINUTES
8 MINUTES

TOO LIGHT GOOD TOO DARK

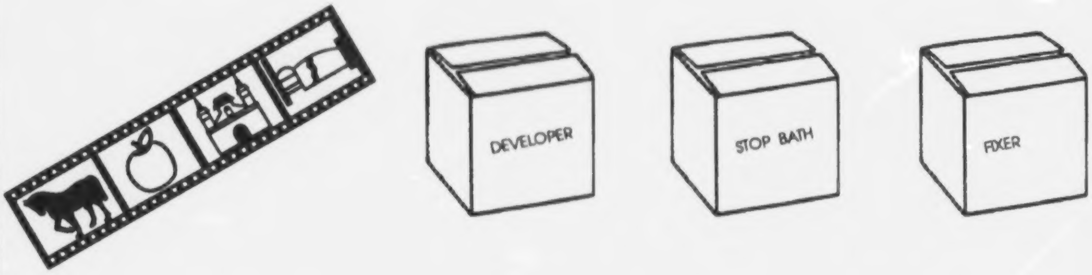
STOP BATH

The stop bath stops the developer from working. When we put the film into the stop bath, the developer stops developing and the film will not become too dark.


DEVELOPER
STOP BATH

FIXER

The fixer is also called *hypo*. It makes the picture permanent on the film. After the film goes into the fixer (hypo), the film will not change any more.

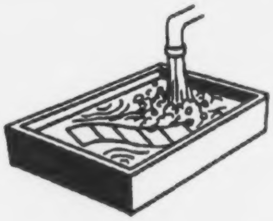

DEVELOPER
STOP BATH
FIXER

Remember

1. Now we can look at the film.
2. When the film is in the developer or the stop bath, we must keep it in the dark.
3. When the film is in the fixer (hypo), we can turn on the lights.

WASH

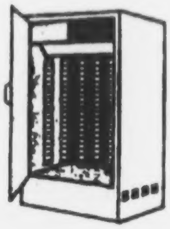
Wash is the water used to remove the chemicals from the film.



STEP FOUR
(Wash)

DRY

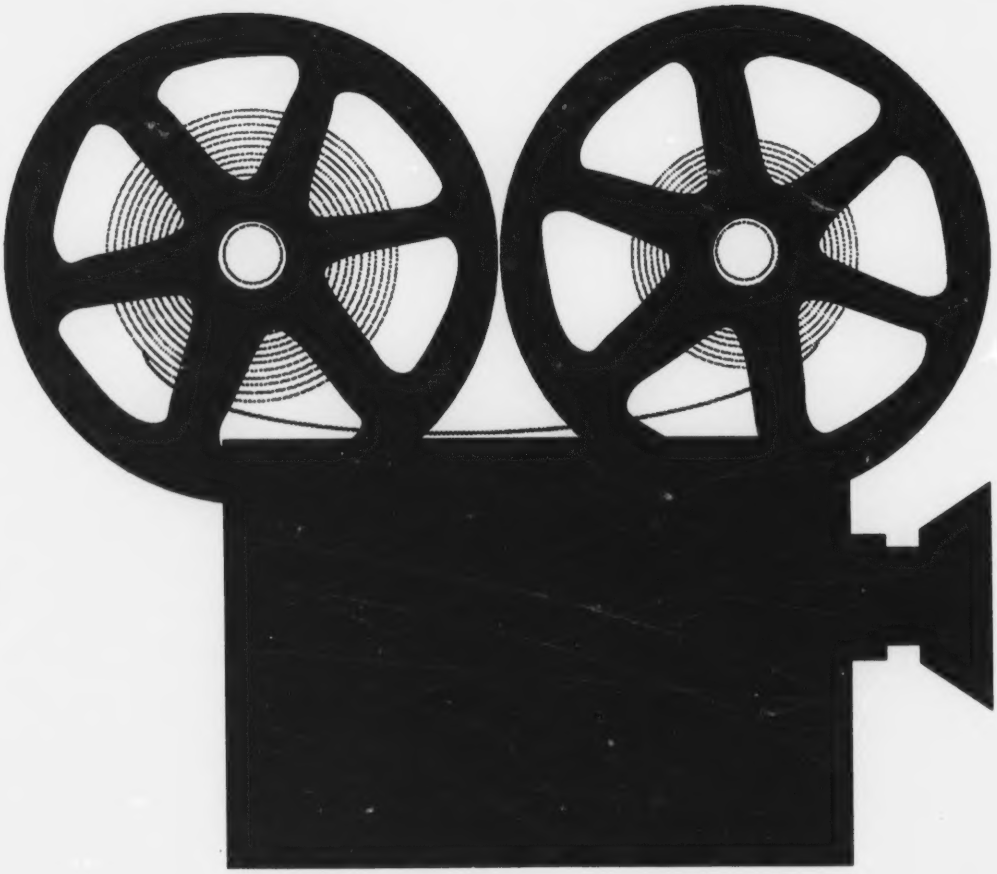
After the film is dry we will have negatives.



STEP FIVE
(Dry)

Remember: In a negative all the colors are opposite the colors of the subject.

FILMS



PROJECT SAGE

BEST COPY AVAILABLE

OBJECTIVES

- ☐ The students will develop an interest and appreciation for the planning and making of silent films.
- ☐ The students will communicate non-verbally an awareness of the overdramatic actions and techniques used in making a movie without sound.
- ☐ The students will have fun writing and filming a silent movie.
- ☐ The unit will stimulate an interest and knowledge of the use of a movie camera, projector, editor and splicer.

PROCEDURE

1. From the public library, check out old silent films such as *Lon Chaney, Buster Keaton, Charlie Chaplin*.
2. After watching the films, discuss and compare problems which might exist when telling a story without sound.
3. Compare different techniques used.
4. Have students think of ideas for a silent movie.
5. The students should decide on a basic plot for a silent horror or comedy movie.
6. The class will select two or three students to write the basic story for a movie.
7. After the basic story is written, the students will contribute their ideas and suggestions for changes.
8. Costumes, props and location of scenes will be decided.
9. The teacher will explain the use of the movie camera and importance of lighting, positions, actions and planning for best results.
10. One scene will be filmed per class meeting with several practice sessions to determine the best angle for *filming* to get the effect wanted.
11. After all filming is completed, the students will view the movie and decide if posters should be made.
12. The students will make posters and film them.

13. A demonstration of film splicing by the teacher or a resource person should come next.
14. The film should be spliced to obtain the best sequence and effect.
15. Students should become familiar with all equipment used.
16. Critique the unit.

MATERIALS

- movie camera and film projector
- film editor and splicer
- costumes and props
- old silent films from public library

ANIMATING FILMS WITH A CAMERA

Introduction

(Based on the film: *Frame-by-Frame* by Paul Burnford and Jerry Samuelson)

Synopsis: This introduction to the art of animation defines a variety of single frame techniques, defines the range of the film from slow motion to normal and then speeded-up action, and then develops the special action achieved through single framing. Techniques include: still picture filming, flicker filming, cut-out animation, cell animation, object and people animation, direct image on film, and time sequence filming.

Basic Equipment: After viewing the film, *Frame-by-Frame*, students will become efficient in the use of the 8 mm camera. They will learn the use of the single frame shutter release, a mechanism that lets one shoot just one frame at a time. Some animation can be filmed by flickering the trigger so lightly that only two or three frames at a time are exposed.

Constructing an Animation Stand

- You need 2 X 2 inch lumber.
- Cut two uprights about 4 feet (1.2 m) high and also a cross-bar of equal length.
- Use c-clamps to fasten them together.
- Nail a triangular support rigidly perpendicular to the bottom of them.
- With a long bolt, attach your camera to the cross-bar using the proper threads to screw into your camera's tripod receptacle.
- Attach any lighting needed.

Demonstration

Timing: Students will work with timing— the speed of movement of an object—to make a reference film or an animation sampler that uses geometric figures.

Creating Depth: Students will work on creating depth by using the relative size of objects, light and dark colors and perspective lines.

Making Cut-Outs and Backgrounds: Students may use construction paper cut-outs for their animated films. The silhouette may be used, as well as photographs. Backgrounds can be designed to get the score or serve as a point of reference for the action. Background designs can be full of detail or only a few lines.

Lettering: Hand-lettered cut-out titles are the least expensive and allow the widest choice in color, size and style. Letters must be easy to read.

Objectives

- ☐ Students will meet together to create a story line, to work out a plan for their ideas and actions and the sequence of scenes. Students can make sketches to help visualize the action.
- ☐ Students should then gather or make the props needed for the film and will design and prepare the backgrounds.

Guidelines

The next task is to determine the timing for each scene. Describe each sequence in words or sketches and record the duration of and number of frames for each one. Note what should be added about any special effects or problems.

When plans have been made, and props and equipment have been gathered, students may start filming.

Students will work in teams for filming. They will demonstrate the skill in using the projector.

Students will view film and critique. Any chances to be made will be accomplished through editing and splicing.

ACTIVITIES

I. Breakdown of a Movement

To extract a movement using static drawings, students must "break it down." This can be done using a form like that of a puppet. Procedure:

a. Make a sketch of your puppet figure on a piece of paper.

b, Transfer the drawing to heavy cardboard.

c. One-by-one, cut out various parts of the body—the torso head, upper arms, lower arms, upper legs and lower legs.

d. Using paper fasteners, assemble the parts so they move easily.

e. On a sheet of paper, draw the basic outline of your puppet.

f. Now move the puppet slightly across the paper and change the position of the arms and legs and draw another outline.

g. Continue until you have a succession of slightly overlapped drawings.

This series of drawings represents the breakdown of a movement.

II. Make a "Flip"

A flip is a small pad, containing a sequence of stacked drawings or drawings super-imposed on another. Each drawing is a snapshot of one part of a movement.

a. The first drawing shows the start of a movement; the last shows the final stage of the same movement.

b. Choose a pad that has semi-transparent paper, so you can easily see the drawing that precede the one that you are making.

c. First determine the limits of the movement—where it will be at the end.

d. Decide how many drawings you will need to reconstruct the movement. You should make 24 drawings for each second that you want the movement to last.

e. On your first flip, plan to have only the arms and one leg c the puppet move. In the first drawing, both arms and legs are at rest. In the last drawing, both arms and one leg will be raised as high as they can go.

f. When finished, "refile" the pages quickly and watch the puppet come to life!

III. Breaking Down a Movement With Slides

a. Make a series of drawings, breaking the movement into parts.

b. Make preliminary drawings large.

c. Take tracing paper and, using either a soft-tip marker or pen and ink, copy drawings on a smaller scale of either 24 X 36 mm (about 1" x 1") or 40 X 40 mm (about 1 5/8" x 1 5/8").

d. Mount each one of the drawings in a standard 2 X 2 inch cardboard frame.

e. Number slides as they are to be placed in the slide projector tray.

f. Project slides as rapidly and smoothly as possible. Students have now gone from merely drawing on paper to actually projecting images—the threshold of film animation.

IV. Drawing on Clear Film

To produce an animated film, even a short one, you must repeat the same image many times, making sure it is always spaced within the frame line.

Make a Film Holding Block

1. Start with a piece of flat wood that is somewhat wider than the film.
2. Add two strips to create a groove of the right size.
3. Measure the width of the film and transfer the measurement to the wood block to make a "slot" that is only barely larger than the film.
4. The length of the holding block should accommodate 24 frames.
5. Attach a tiny peg on the block to hold film as you draw.
6. Take sturdy paper and cut to the size of the groove
7. Mark off frame lines on the paper strip.

8. Draw pictures on paper first.

9. Trace the design onto the clear film.

V. Rhythm

One section of projection on a screen corresponds to 24 frames on film. This is the basic unit for calculating the time for the reproduction of one movement and from that, the duration of the total length of a film.

VI. Harmony of Colors

Discussion of phenomenon—persistence of vision (the image which is disappearing)— still affects the retina at the moment the following image is presented.

Strong influence of colors in preceding image upon impression of the colors of an image increases or decreases.

VII. Breakdown on a Subject into Simple Form

Geometric form can be extracted from every form you choose to animate. Drawings can be based on simple geometric forms (circles, square, rhombus parallogram) which when put together, represent certain people or animals. To this "geometry" you add the breakdown of movements.

VIII. The Story Board

An animator sets up a story board which is the plan of your film. It includes a brief description of the story, duration of and number of frames for each part of the plan and corresponding sound effects.

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ANIMATING FILMS WITHOUT A CAMERA

In animating films without a camera, students will learn how to draw and color directly on film—not only images, but sound, too. Because of the small scale of film drawing, only the simplest of forms is required, and some films are completely non-representational—simply the interplay of lines and colors.

Children can produce animated films that tell a story or, amuse viewers with something as simple as putting a group of dots through some zany antics.

Using just imagination, creativity, and commonly available materials such as pen and ink, soft-tip markers or a scratching implement like a needle, one can produce figures that move and transform themselves into other objects, and designs that seem to appear from nowhere and then disappear again.

ECONOMICS

PROJECT SAGE

OVERVIEW: Consumer Awareness

Students will develop an awareness that consumer choices, including their own, have an impact on the economic system.

OBJECTIVES

- ☐ Students will understand the impact of consumer demand on production.
- ☐ Students will develop consumer awareness of advertising effects, consumer rights and product selection.
- ☐ Students will identify the opportunity cost of everyday purchase
- ☐ Students will become knowledgeable of the techniques and strategies used by the advertising industry and evaluate their effect on consumer buying of supply and demand and apply it to the economy.
- ☐ Students will use the following activities to carry out the above objectives.

BRAINSTORM JOBS

Indicate the work your parents do. Indicate whether it results in the production of goods or in the production of services.

CONSUMER GUIDANCE

Once you have a job, you will be paid a salary. When you use this money to buy the goods and services that you choose, you are a consumer. Your desire to obtain goods and services will often be the motivation behind your willingness to work. Attention Consumers: Intelligent buyers get more value for their money. How can you find the best buy?

BICYCLE BUYING

Wheeling and Dealing: There are many ways to shop for a bicycle. Do you want a new or a used bike? You can go to the store, read advertisements in the newspaper or look at mail order magazines and store catalogs. You can place an ad in the classified section. You can use a credit card or layaway plan. What would you need to obtain a bank loan? Consumer reports are available for you to read, or you may go to a garage sale.

1. *Did you buy a bicycle for one, two or three?*
2. *How did you find your bicycle?*
3. *Where did you buy your bike?*
4. *What compromises did you make?*
5. *Can you buy three bikes with $100?*

Before you pay extra for one kind of bike you should know exactly how it is different from other kinds by using ads, newspapers, mail order magazines, store catalogs and consumer reports. Research the basic differences between bikes and use that information to determine what type of bike is best for you. Organize your information by keeping charts, logs etc.

Basic Business

Every person in business needs to understand the following concepts:

- ☐ Producers and Consumers
- ☐ Supply and demand
- ☐ Scarcity
- ☐ Inflation

The considerations of what goods or services to produce or provide, what resources they will require, who the intended consumer *is* and where to distribute the goods or services influence each of these concepts.

PRODUCERS AND CONSUMERS

Every business needs producers and consumers to operate. People who make and sell things are producers. They spend money to buy the necessary raw materials to manufacture their goods or to maintain their service operations. They earn money by selling these goods to other people—consumers. Purchases made by the consumer help determine what and how many goods are produced.

From resource to product: When you combine resources to make a product you are a producer. If you can hold the product in your hand, you have produced a good. If you have done work that will benefit other people, you have provided a service.

PRODUCE-A-PUPPET

Make a list of various jobs. For example, secretary, teacher, coach. Select one job and make a producer-puppet to correspond with the selected job. Use a half-gallon milk carton. Cut horizontally through three sides in the center. The fourth side will act as a hinge so the puppet can talk. Insert a red rectangular strip for the tongue. Decorate the puppet. Conduct an interview.

Does your puppet produce goods or provide services?

Where does he or she work?

How can he or she be contacted?

PRODUCT PAPER

Provide opportunities to combine resources to make products. Describe the product. Write the directions so that a friend can make your product, too.

SUPPLY AND DEMAND

Supply and demand is the balancing between the supply of goods and services and the demand for them by the consumer. The consumer's willingness and ability to spend money for certain goods and services is called the demand.

The demand is influenced by the quality of the goods and services and, of course, the price.

The supply of goods and services is determined by the cost of production and the selling price.

Generally, when the price of an item goes up, the demand for that item goes down.

What happens when the price of an item goes down?

At the Marketplace: Consumers and producers (or buyers and sellers) come together to exchange goods, services and money. The market place is where these transactions take place and where prices are set.

Why is the marketplace similar to the old barter markets?

Questions of Balance

Why would a producer increase the supply of an item?

Why would a producer decrease the supply of an item?

What can happen to prices if the consumer demands more of a good or service?

What can happen if the consumer no longer demands or desires a good or service?

Scarcity vs. Surplus

When the supply or amount of a product is less than the demand for it, there is a scarcity. When the supply or amount of a product is greater than the demand for it, there is a surplus.

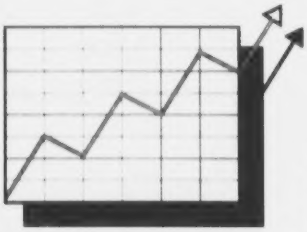
Consumer Economy

Today, almost two thirds of our nation's total economic output consists of goods and services purchased by people and households for personal use. The remaining one-third is bought by business and government. Our economic system is sometimes called a consumer economy.

When Things are Scarce

If two dogs want one bone,
'Cause each dog thinks the bone's his own,
It's a scarcity, to solve it—how?
They could share or have a row.

Which do you think should own the bone? How do you decide the fairest way to solve the scarcity solution? (Fight? Share? Draw straws?)



Inflation

Inflation is the continuous rising of prices of practically all items in the economy at essentially the same time. The causes of inflation are sometimes discussed in terms of *demand-pull* and *cost-pull*. Demand-pull is an inflation situation when total demand for products exceeds total supply. The demand results from the increased amount of money in circulation in the country. Cost-push is an inflation situation when costs of products and services, especially wages and salaries, rise and push up the cost of production. The sales price increases to meet these too few goods and services.

What does inflation do to the price?

Can you think of items in the store that cost more and more each month?

A Demanding Stand

There once was a lemonade stand
But business does not go as planned
A decrease in the lemon supply
Made the prices rise sky-high

What do you think happened to the lemonade stand?

Some Demanding Situations

1. A skateboard manufacturer sells the latest shipments of skateboards on the first day. They were priced at $19.95. Would you advise the manufacturer to raise, lower or keep the price the same? What factors would you consider?

2. A shop specializing in recycled blue jeans is doing a very limited amount of business. The price of these special jeans is $25.00. If the store owner reduced the price, do you think business would increase? What factors should the store owner consider? Is this situation one of scarcity or surplus?

INFLATION

The prices are rising

All across the nation

Even bubble gum costs more

This is called INFLATION

CONSUMER AWARENESS

1. Consider jobs that parents and other people do. Indicate whether those jobs result in production of goods or services.

2. Because of increasing labor costs for packaging, materials, and transportation, the price of foods in the supermarket has increased rapidly during the past year. One way the family food budget can be stretched is through careful shopping. Use food ads in newspapers to compare eight different types of foods and their prices. List each price and circle the best buy and where it can be found.

3. Make up a money-saving recipe, using one product from your list.

4. Smart shoppers often take advantage of sales. One problem with sales is that items often cannot be returned or exchanged. Make a check list to use to avoid unwise purchases of sales merchandise.

ADVERTISING

1. What purchases have you made because of advertising? Graph these into categories.

2. What are some of the ways and kinds of appeals that advertisers use to try to sell something?

3. How can you tell the difference between false or misleading ads and truthful ones? What can be done to combat these misleading ads.

4. What were the factors involved in the ban on cigarette advertising on TV?

CONSUMER PROTECTIONS

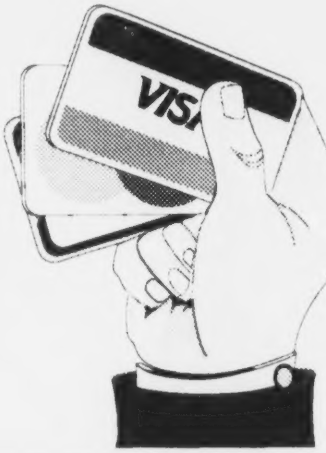
1. How do federal or state consumer agencies differ from private groups?
2. Does the federal government have the right or obligation to protect consumers from shady or misleading business practices?
3. What are class action suits? Are they effective?
4. What in general should you do to protect yourself against deceptive business practices?

AUTOMOBILES

1. What can a consumer do about protecting himself when taking a car in for service or repair?
2. What can you use or do to keep from making a bad decision when buying a used car?
3. Do you believe that new cars are safe? Why and why not? If manufacturers are not doing everything they could, what do you think they are not doing?

CREDIT BUYING

1. What are the advantages of buying on credit? What are the disadvantages?
2. What should a purchaser do when buying a major appliance on credit and presented with a credit purchase contract?
3. Take a survey in your neighborhood shopping area of how much more you have to pay if you buy on credit rather than with cash. Ask for a blank copy of a contract (i.e. bank). Take different lengths of installment contracts into consideration.



FOOD

1. What kind of information do you need to get your money's worth?
2. If you had the power to make a law about packaging, what would you include? Would you require all sellers to have standard-sized packages and standard quantities? Be fair to the producer as well as the consumer.
3. What should be done about the fact that markets (many other businesses) sometimes charge more in poor than in middle class neighborhoods?

ADVERTISING

Advertising is designed to encourage the consumer to buy a certain product. Sometimes facts are stretched to encourage impulse buying.

1. Look through the ads in newspapers. Select an ad that you think represents the product very clearly and honestly and another ad that you think represents only the features in a way that might be misleading. Evaluate different techniques being used.
2. Design a new product you wish to put on the market and make a label. Make sure your product will be in demand by consumers. Choose any method of advertising to promote your product.
3. Select one of the following products and design a good ad. Remember, advertising space is very expensive. You will want to be sure to tell the name of your product, what it is used for, how much it costs and make it very attractive to the prospective buyer.

   -a color television set -a mini bike

   -a fur-trimmed coat -cereal

   Write a television commercial to advertise the same product.

WHEELING AND DEALING

Before you pay extra for one kind of bike, you should know exactly how it is different from other kinds.

1. Use ads in newspapers, mail order magazines, store catalogs and consumer reports to research the basic differences between bikes. Use the information that you obtain to determine what type of bike is best for you. Organize your information by keeping charts, logs, etc.

2. Using any form of poetry, write a poem about a product you have purchased that has not lived up to your expectations.

   For example:

   I once knew a weird guy named Lou,
   Who made up a batch of beef stew,
   On the range went the pot,
   Up in smoke went his lot,
   And now he's got beef he can't chew.

BECOME A JEANS GENIUS

Jeans were first made during the 1849 california gold rush by a man named Levi Strauss. He sold them to gold miners, who needed work clothes that could take lots of wear and tear.

Today, jeans are a part of everyone's wardrobe. They are worn for play, to school, to parties and just about anytime we need pants that are comfortable and easy to take care of.

Buying a good pair of jeans takes time. You have to find a pair that fits right and that will last.

1. Write a booklet that includes helpful tips for purchasing long-lasting jeans. Survey the brands currently on the market and set up your own personal criteria for judging why a certain brand is bought more often.

2. Create a top-ten jean chart based upon your findings.

ADVERTISING: Fair Persuasion?

Objective The gifted student will become knowledgeable of the techniques and strategies used by the advertising industry and evaluate their effect on society.

Research Questions

1. Investigate techniques advertisers use to encourage people to buy their products. Evaluate these techniques.
2. Interpret and explain the statement fair persuasion or unsupported propaganda.
3. Does the person who advertises a product affect the sale of that product? Explain.
4. What area of human endeavor produces the people used most often in advertising today? (e.g., sports, entertainment, science, arts, law, government, etc.) Support this reasoning.
5. How does today's advertising compare with the advertisements of 10 years ago? Have our heroes changed? Have our values changed? Can you identify any trends or reasons for the change?
6. Explain the methods used by advertisers on children's TV to influence adults through the child. Evaluate the effectiveness of their methods. Critique the manner of advertising being presented.
7. What types of visuals are most effective in advertising and why?

Means of Investigation

1. Examine advertisements in newspapers and magazines. Compare ads for similar products to evaluate different techniques being used.
2. Evaluate a product you buy and your reason for using it. Is it really better than a competitor's product? Survey others for their feelings. How have you been influenced by advertising?
3. Record the subject area represented by the people pictured in magazine ads of 1967 and 1978. Compare.

4. Each day, in the school hall, display a different picture which shows a person who is promoting an advertisement theme. Note interest shown in each picture. Compare these results with the recorded information above for 1978.

5. Assume the role of a critic of Saturday morning TV. What type products and advertising techniques are being employed? Categorize them according to the type of product being sold and by the techniques being used.

6. Determine the long term value of the products being promoted most intensely, both in terms of time and hard sell. Evaluate the food products for their nutritional value and evaluate toys for their long range value. Compare the value with the advertising campaign.

Report and Dissemination

1. Graph or chart people's feelings about the influence of advertising and, their product choices.

2. Hold a panel discussion on the reasons for the change in popular heroes. Include a discussion of values.

3. Create advertisements for class or school newspapers using techniques observed.

4. Create commercials for TV. Exaggerate facts, but make the ads credible.

5. Prepare a play and present it to primary age children, pointing out the results of the study of Saturday morning TV advertising. Develop an awareness of the techniques used by large ad companies that entice the public to buy their products.

6. Determine the five best commercials on TV, then analyze and evaluate the reason for their effectiveness. Then write to the TV advertisers requesting information about their rationale and expectations for their TV commercials.

ACTIVITIES

Consumer Needs

DECISIONS! DECISIONS! (Grades 2-5)

Purpose To introduce students to the decision making process regarding needs.

Materials Put the following list on the chalkboard; different kinds of foods, water, oxygen tank, space suit, radio, first aid kit, books, cookies, television and toys, small envelopes, old catalogs and magazines.

Introduction to the Class

List things on the chalkboard that one would take on a space flight. Each student should cut out pictures that show ten of the listed items and put them in an envelope. The teacher may want to discuss the list with the children before the childern cut out the pictures. Explain that the class in now in orbit, trouble has developed, and the ship has lost some fuel. Instruct the students to discard one item from their envelopes to lighten the ship. Continue suggesting problems until each student has only five items left in his or her envelope. The students must get along now, for the rest of the trip, on what they have left in their envelopes. Have the students write the names of these items on the outside of their envelopes, but tell them not to write thier own names. Then have the students hand the envelopes in. Tally the items remaining and compare this list to the original list on the board. Discuss the results. Ask the students how they decided which items to discard. Ask if some items were more valuable than others and why they were more valuable. Ask if the items satisfied an important need or want.

Variations and Related Ideas

1. Discuss how space available helps you decide what is necessary.
2. Discuss the difference between needs (survival) and wants (nonessentials).
3. Make a list on the board of what the children would like to take on a space trip. Seek enough suggestions to make a long list. (The list will probably be mostly wants, not needs.) Introduce the storage problem and ask the students if they think they can take all those listed items. Try to separate the needs and wants. Help the students realize how they made their choices and decisions about which items they should take.

REGIONAL CONSUMPTION (Grades 2-5)

Purpose To understand that people from different regions of the United States consume different types of goods and services.

Materials Magazine pictures of food, clothing, and shelter from four different regions of the United States. Construction paper, or poster board, scissors, glue and felt pens.

Introduction to the Class

Divide the students into four groups that represent four different regions of the United States: New England, the Midwest, the Rocky Mountains and the West Coast. Each group is to prepare a chart that contains pictures whcih show how the people in one of the designated regions satisfy their needs for food, clothing and shelter. Try to show the items which are grown or manufactured in that region. Add any lettering with the felt pens. To help the students with their charts, ask the students the following questions and discuss these questions with them when they have finished making their charts.

1. How does the climate affect what people consume? (People wear heavier clothing in the northern regions. Houses are often air-conditioned in southern regions or have more windows.)

2. Does the nationality of the ancestors who live in any region of the United States affect what is consumed? (To some extent, ancestral customs influence diet.)

3. Do the resources available in any region affect what is consumed? (People on the coasts may eat more seafood. Availability of lumber, limestone or other building materials may effect the types of houses built.)

FOOD EXCHANGE (Grades 5-7)

Purpose To show the effect of international trade on consumption patterns of the family.

Materials Research materials on food products grown in the United States, Mexico and Brazil. Use of a library.

Introduction to the Class

The teacher should divide the students into three groups that each represent one of three countries: the United States, Mexico and Brazil. Each group should then learn the types of food products their assigned country grows. They should use the included materials first, then they may go to the library for additional information. With the librarian, the teach should arrange for the visit in advance. The students should develop menus for breakfast, lunch and dinner using only products grown in their assigned country. The teacher should then display these menues on the bulletin board. The teacher should then ask the students the following questions:

> *Does one of the other countries grow a food that your country doesn't, and would you like to include that food in your menu?*
>
> *How can you obtain that food from the other country? One way might be to trade a product that your country produces for one that the other country produces.*
>
> *How does trade affect people from each of these countries? All are better off since they can obtain goods and services which are not available in their country.*

Variations and Related Ideas

1. Have students prepare a sample of foods from various countries and then have students eat those foods.
2. Discuss how resource availability affects product availability.

ACTIVITIES

Specialization Independence Of People

FAMILY JOBS (Grades K-2)

Purpose To show that family members are specialists because they are responsible for jobs they do best.

Material Pictures of family member working around the house.

Introduction to the Class

Teachers should ask their students to discuss the work the students' family members do around the house. The teacher should discuss the reasons that people do those jobs and then show pictures to the students asking them the following questions:

What are the jobs the fathers are doing?

What are the jobs the mothers are doing?

Why are the people doing what they are doing? (The teacher should ask how long each job might take.)

Are the mothers and fathers dependent on anyone else in the production process in order to do their jobs?

Does someone else have to do work before the parents can do their work?

Do your parents always do the same jobs or do they switch jobs sometimes? (Let students answer the questions orally. Try to get several different answers.)

To get work done, often many people must work together, but they may do many different jobs.

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JOB CATEGORIES (Grades K-3)

Purpose To help students understand that specialization increases the interdependence of people.

Materials Notes that ask the students' parents if they might describe their jobs for the class.

Introduction to the Class

When writing the note, the teacher should include a request for parents to describe their jobs and should also ask the parents if their jobs produce goods or provide a service. The teacher should then give the notes to the students to take home to their parents.

When the students have returned their parents' replies, the teacher should list the jobs on the board that the parents have described. The teacher should write two headings on the board: 1) Jobs that produce goods, 2) Other jobs.

Producing Services

1. The teacher should then ask each student to describe what their parents do and ask the student if their parents produce goods or a service. After the students explain the jobs their parents do, the teacher should ask the students to decide which category to place those jobs under and then list those jobs under that category.

2. The teacher should also ask the students to explain why their parents have selected those jobs.

3. The teacher should also explain to the students that many people choose to do work that they are good at and that many people refer to themselves as specialists, when in fact, they are part of a whole production team. For an example, the teacher could explain that in a grocery store, while some people might be doing only one specialized task such as cutting meat, others might be doing many unspecialized tasks within the same market, but all depend on each other for the efficient operation of the store.

4. The teacher should ask the students if they can tell from the list on the board which jobs depend on others? The teacher should then discuss people's job-related interdependence and explain how, in their production efforts, they utilize their many skills and resources.

WORKING AT SCHOOL (Grades 1-4)

Purpose To show the division of labor within the school.

Materials None.

Introduction to the Class

1. The teacher should ask the students to think of different jobs that people do at school? List those jobs on the board.

2. The teacher should ask the students what would happen if the people who had jobs in schools tried to do every job in the school? The teacher should try to help the children understand that some jobs might be done poorly because the people doing those jobs might not know how to do them and, that some jobs might not even get done. Also, the teacher should explain that when everyone tries to do doing everyjob, time will not allow everything to get done.

3. The teacher should ask the students what their jobs are at school. For example, student jobs might be to go to school, be on time, do work . The teacher should then ask the students if they have ever thought of the going to school as a job—their specialty.

4. The teacher should then ask the students what would happen if all the jobs in the school and people who performed those jobs were interchanged—that is, perhaps the secretary would work as the janitor, the janitor as the teacher, the teacher as the cook, and the cook as the principal. The teacher should then help the students see the importance of job qualifications.

Each worker in a school, office or factory is an important resource in the operation.

ASSEMBLY LINE (Grades 2-4)

Purpose To show students the difference between the assembly line and personalized methods of production.t

Materials One small, clean, empty frozen orange juice container for each student, construction paper, paint or crayons, paste, and scissors.

Introduction to the Class

Using two different methods, the students will make pencil holders as gifts for their parents. Some of the students will form an assembly line, and the rest of the students will work individually. Both groups of students should obtain the same finished product. To begin, the teacher should divide the class into two, equal-sized groups and give each group the correct amount of materials to make the project. The teacher should instruct some students in the assembly line group to cut the paper, others in the group to draw the pictures and the rest, to paste the pictures on the containers. The teacher should then instruct the individuals in the other group (the individual group) to do each job themselves. The teacher should then keep track of the time it takes both groups to finish the project.

Both groups should start at the same time. The students should draw a picture on the paper, cut it out and paste it on the juice can.

Who finished first? The individuals or the assembly lines?

Which group made the best projects? (The assembly line should have finished first, and should have had better projects because those students specialized on only one task.

Teacher's Note

If the assembly line does not finish first, ask the students why and ask them where changes could be made to make the process more efficient.

By using the assembly line and specializing, one can become an expert at one job . Ask the students if people can become too specialized? Explain that this happens when we make special jobs have too few tasks.

SHIPWRECKED GAME

1. Divide the class into groups of two.
2. Give each student five slips of paper.
3. Give each group a commodity.
4. Students draw and label their commodity on all five slips of paper.
5. Give students a five minute trading period during which time they can trade or barter their commodity.
6. Call a halt to trading. Students return to their seats.
7. Give situation:

   We are not in the classroom but on a ship at sea in the North Atlantic. Ship hits iceberg, then sinks. We all made it to a deserted island, thousand miles from anywhere. Island is frozen and barren except for dried timber and penguins.
8. Students get two minutes more to trade.
9. Call halt to trade.
10. List commodities on the board. Have students determine priority of items. Pick winners, according to the group which had highest priority items.

CREATIVE PROBLEM SOLVING
Money and Business

Blight Blasts Business

The following is a problem that involves group solutions, money and business,and:

a. water
b. motorcycle
c. matches
d. stereo
e. gasoline
f. flour
g. winter coat
h. hockey skates
i. Coleman stove
j. tent
k. candy bar
l. gun
m. hip boots
n. fishing pole

1. critical thinking
2. deductive reasoning (drawing conclusions)
3. Inductive reasoning (making inferences)
4. synthesis of information

The following is a list of information about the country of Blight. Many factors are given that present a situation that requires student ideas for its solution. As a group:

1. Analyze and state the problem facing Blight.
2. Decide what groups in Blight are presented with this problem.
3. Divide yourselves into the major groups represented.
4. Consider possible solutions that best meet your group's needs.
5. Present your solution through discussion or debate, to the other groups.
6. Decide the best solution for Blight.

BLIGHT

1. Blight is an industrial country, one of the major nations of the world.

2. The blast (bl.), worth \$2.00 in U.S. money, is the currency of the Blight. It has always had steady or sound value, and many other countries have used it to back their own currencies.

3. But the government, to make Blast products cheaper and more attractive to the Blighties than the products of other nations, has spent many of its reserve blasts.

4. As a result, Blight borrowed \$5 billion from friendly nations to keep the value of the blight at \$2.00.

5. In Blight now, is work for everyone, and the people are earning more money than ever before.

6. Goods usually become more expensive when wages are improved.

7. People have been spending much money for imported products.

8. They had also been buying some of the domestic goods, products made in their country, that would normally be exported.

9. To reduce the flow of money out of Blight, the government placed taxes on imported goods.

10. The government has also limited the amount of money that could be spent by the Blighties in overseas investments or travel abroad.

11. Taxes on exports have been reduced *so* more goods will be sold overseas.

12. The government *is* also trying to reduce the spending of money in Blight by raising taxes on popular goods and making it more difficult to borrow money.

13. When it becomes more difficult to borrow money, sales of products slow down, there is less work for the Blighties, and less money to be earned.

14. Because of competition from other countries, Blight sells fewer goods overseas than it did 10 years ago, though other countries are selling more.

15. In some parts of the country, there is regular unemployment, but the workers will not move to other cities where there are more jobs.

16. Strikes are fairly common.

17. On the docks it takes a great many men a long time in the loading and unloading of ships, resulting in great delay and expense.

18. The factories of Blight are generally small, using old-fashioned methods and equipment.

19. Factory owners do not want to join together to form larger, more efficient companies.

20. There is the danger that countries using the blast to support their currencies will turn in their blasts for sounder money, which will cause the blast to lose its present value.

21. Blight must repay its loan in the next five years.

ECONOMICS: Basic Business

Overview Students will develop an understanding of scarcity with relation to the economy, factors of production, supply and demand and opportunity cost.

Objectives

- ☐ The student will be able to define and have a workable understanding of production and consumption.
- ☐ The students will recognize differences between goods and services.
- ☐ The students will understand the concept of supply and demand.
- ☐ The students will be able to identify local goods and services.
- ☐ Students will learn about the theory of inflation and its effect on the economy.
- ☐ Students will learn about sales, profit, labor and competition regarding business practices.
- ☐ Students will become familiar with marketing and its effect on business practices.
- ☐ Students will use the following activities to carry out the above objectives:

Mind Your Own Business

A person can become a producer by creating a self-owned business. Money can be earned by providing goods and services for the community. Building a successful business is a great responsibility. People go into business for themselves for many reasons. If you decide to do so, you will be busy every day, but you will earn great dividends — pride, enjoyment and independence, to name just a few.

Decision Making

A business is any occupation, profession or trade. Before going into business, you must make some decisions.

Opportunity Costs: *A Costly Choice*

Every time we make a decision between two or more choices, it costs us something. We must weigh the benefits of the decisions we make against the benefits we have gained had we chosen one of our alternatives. The alternative that we sacrifice to our first choice is the opportunity cost.

Product Paper

Provide opportunities to combine resources for making products. Describe the product. Write the directions so that a friend can make your product, too.

GIVING YOU THE BUSINESS

Business Smart: *Competition*

Competition is a fact of life for every business person. The government in a country can pass laws to insure that competition is maintained in all the areas of business. When only one firm exists in a particular area, it is called a monopoly situation. When only a few firms are in a particular area it is called an oligopoly situation. Businesses that operate most efficiently gain consumer acceptance.

How can competition dictate the survival of a business?

How can competition affect supply and demand, profit and loss?

Can you think of an example of a monopoly situation in your community?

Can you think of an example of an oligopoly situation?

Business Profit

Profit is the basis of business. It provides the incentive for developing new ideas and attracts the investment monies needed for progress.

How is a business person like a juggler?

Business Attitude: *Consumer Relations*

Human relations is a key element in any business, large or small. Consider the dialogue below:

GOOD MORNING!

Customer: Good morning
How are you today?

Storekeeper:	I'm busy What is that you say?
Customer:	I said, Good Morning. How are you?
Storekeeper:	I won't know until the day is through.

1. Review the dialogue between the storekeeper and the customer. Can you think of a different, more pleasant response for the storekeeper? How would the customer feel in such a situation?

2. Changing the Dialogue

   Write two scripts; one will indicate an effective, pleasant way to relate to a customer; the other, will demonstrate a sure-fire way to lose your customers and reputation.

BUSINESS

Supply and Demand

You will find that three factors influence the demand for any product or service.

1. Demand depends in part upon people's tastes, which can be influenced by everything from advertising to weather.
2. Demand depends, in part, upon people's income. When income drops, as during a strike or recession, people cut back on their spending.
3. Demand depends, in part, on the availability of substitute products or services.

You are to choose a particular product or service, and interview a person who sells it in your community. The person may be a druggist, a grocer, a shoe repair person, a tailor or any other merchant. Ask them if there has been fluctuations in the demand for their product or service over the past year. For example, did they sell more or less of their product or service during some months? If so, what caused the fluctuations? If not, why did the demands remain steady? Report to your class on your findings.

Advertising

1. Graph or chart people's feelings about the influence of advertising and their product choices.
2. Hold a panel discussion on the reasons for the change in popular heroes.
3. Create advertisements for class or school newspaper, using techniques observed.
4. Determine the five best commercials on TV, then analyze and evaluate the reason for their effectiveness. Then write to the sponsors, asking them to compare your findings with their rationale and expectations.
5. Interpret and explain the statement *fair persuasion or unsupported propaganda*.
6. Does the person who advertises a product affect the sale of that product? Explain.
7. What area of human endeavor produces the people, used most often in advertising today? (sports, entertainment, science, government, etc.). Support this reasoning.

8. Compare today's advertising with the advertising of 10 years ago. Have our heroes changed? Have our values changed? Can you identify any reasons for the change?

9. Explain the methods used by advertisers on children's TV to influence adults, through the child. Evaluate the effectiveness of their methods. Critique the manner of advertising being presented.

10. Evaluate a product you buy and your reasons for using it. How have you been influenced by advertising?

Simulation Company

How would you go about setting up a business/money-making venture? Write a description of your business. Prepare application forms and establish a system for hiring people to work for you. Consider pay scale paychecks, banking, unemployment. Can you do it? Try it!

Simulation Market

How to Prepare

Four sets of different colored cards (3 x 5 inch or smaller) will be needed. One set of white cards should be prepared for consumers in the first simulation and a second set of blue cards should be readied for producers. A third set of red producer cards will be needed for the second stage, while a fourth set of green consumer cards is needed for the third stage.

How to Carry Out the Simulation

Stage 1:

Tell the students that they are about to play the roles of producers and consumers, interacting in a market. They will act as buyers and sellers of birdhouses.

The class will be divided into equal sized groups. The teacher will act as the announcer, announcing the exchange price of each transaction. One person will act as the recorder, listing each transaction (sale) price on the chalkboard.

Each producer (seller) will be given a producer card and each consumer (buyer) will be given a consumer card. The remaining producer and consumer cards should be placed on a table near the teacher.

The producers will be told to sell birdhouses at any price, at or above, the price listed on their cards.

When a producer and consumer agree upon a price, a sale is made. They come to the teacher and indicate the price agreed upon. The announcer calls out the price to the students and the recorder lists the price on the chalkboard. They then return to the market after returning their producer and consumer cards and taking different ones (cards). To reduce one's possible frustration of not concluding a transaction, because of a card price being too high or too low, tell the students to exchange their cards for different ones at the table if they cannot conclude a transaction within two minutes.

All students should keep a record of their transaction prices. At the end of each market period, each producer will determine an average sale price and each consumer an average purchase price.

The winners are the producer(s) who receive the highest prices or are consumer(s) who pay the lowest prices This is in accord with the basic goals of producers and consumers.

For the first market simulation, after the students have played their roles for about 5-10 minutes, the market should close. At this time the teacher should call attention to the list of market transactions on the chalkboard. The range of transaction prices should be wide, but it will tend to cluster about the market-clearing price (that price at which the number of items offered by sellers exactly equals the number taken by buyers). After this point is discussed, the market will be reopened. Given this added insight, the transactions should tend to cluster closer to the market-clearing price. The market should close after a second 5-10 minute period.

Stage 2: In Stage 2, (red cards used) an increase in the market price (to about $1.30-$1.40) should occur. By reducing the supply of birdhouses at each possible price, we are actually offering fewer birdhouses for sale while maintaining the same consumer demand. This situation will inevitably raise prices. Students will be asked what situations in our real economy might occur to reduce supply. (Answers might include: natural disasters, monopolies or even governmental regulation.)

Prices	Number of Cards			
	White Consumer	Blue Consumer	Red Consumer	Green Consumer
$2.00				1
1.90				1
1.80			1	2
1.70			1	3
1.60	1	1	2	6
1.50	1	1	2	3
1.40	2	2	4	2
1.30	3	3	4	1
1.20	6	4	4	1
1.10	3	4	1	
1.00	2	4	1	
.90	1	1		
.80	1	1		

Stage 3: The green cards are introduced in the third phase of the game to simulate an increase in the demand for the product, due to an improvement in quality. Again, this section of the simulation has many day-to-day applications which will be pointed out to the class:

1. There are changes in tastes and desires for goods and services, due to actual product improvement.
2. Perceived differentiations in products may increase consumer demand.
3. The role of advertising is increasing consumer demand.

If examples of collusion are seen, talk about them.

What did the colluders seek?

Were they successful?

What lessons does this suggest to them about the real world?

Assembly Line Simulation

The following activity will help to show how the assembly line changed both production process and the products:

1. Arrange most of the class into two rows with the same number of students in each row. These rows will be assembly lines, A and B. Each student will assume the role of a worker with a specialized task.
2. The product is an automobile. Before class, plan an automobile, consisting of as many parts as workers in each assembly line. Each of the automobile parts will be a job for one of the assembly-line workers. For example, the outline or silhouette of the body is skill number one; the front fender, skill number two; the windows, skill three. Parts should be labeled with corresponding numbers.
3. Assembly lines, A and B, will be assigned identical tasks. The first worker in each line gets 25 sheets of paper. This worker draws the outline of the car on each sheet and passes it to worker two, who draws in a fender. The paper progresses down both lines and the cars grow. Each part is to be drawn identically each time — same size, same shape.
4. The students not in the assembly lines are craftsmen who build cars from scratch. They begin their work as the assembly gets started.
5. When the assembly lines have completed their quotas, collect their cars and the custom-built models.
6. Discuss how and why the products are different. Have the workers in both production methods discuss their feelings about their jobs. Also discuss any problems that arose — pile-ups, uneven distribution of work — and possible solutions.

ECONOMICS: The Stock Market

Overview

Students will develop knowledge and awareness of the stock market operation and its relationship to our nation's economy.

Objectives

- ☐ Students will understand how the stock market operates.
- ☐ Students will understand the causes for fluctuations of stock prices.
- ☐ Students will learn how to read the stock market report in the newspaper.
- ☐ Students will learn to convert stock market quotations into dollars and cents.
- ☐ Students will determine commission and final costs of stocks.
- ☐ Students will make decisions about buying and selling stocks.
- ☐ Students will use the following materials and activities to carry out the above objectives:

1. Various readings about the stock market.

2. Write to:

   American Stock Exchange, Educational Services
   Department, Information Services Division, 86 Trinity Place
   New York, NY 10006, for available material.

3. Research Questions:

   a. Trace the history of the New York Stock Exchange. Compare it with the Corn Exchange and Foreign Exchange.

b. Investigate the impact of the Stock Exchange on our economy.

c. How does money grow?

d. What makes the market move?

e. Analyze the effect of daily political events on the stock market.

f. Evaluate the risks involved in making stock investments.

g. Interpret the stock market report in the *New York Times*.

h. Evaluate the comparisons of investments in stock market, bonds and savings banks.

4. Activities:

a. Prepare charts that show your earnings from a stock market investment compared with your earnings from a bank investment.

b. Prepare a booklet, explaining the mechanics of the N. Y. Stock Exchange.

c. Create a board game similar to Monopoly to develop the concept of the stock market.

d. Invent a company, issue stocks and record development.

e. Organize a debate on the values of stock market investments.

f. Compose a documented report on the history of the stock market to be entered in school library as a research instrument.

g. Write letters to various companies, requesting information about the company. Write a short report on one of the companies. Tell what the company does or makes. Show pictures of its products or samples of its advertisements. Tell where it is located, how big it is in relationship to other companies in its field, how long it has been in business. Chart the company's activity on the market for a month's time. Analyze the possible effect of world events on the company.

h. Talk to your parents about stocks. Do they own any? If so, ask to see the stock certificates. Why did your parents choose to buy these particular stocks? How have stock market values changed over the years?

ECONOMICS

Overview

The purpose of this unit is to expose students to experiences, materials and information regarding various economic concepts including:

- ☐ Money (history, banking, foreign currency, saving, spending, inflation)
- ☐ Consumer Awareness
- ☐ Basic Business
- ☐ Stock Market

The intention of this study is to provide a broad background for various economic principles. Each topic re-creates real life problem-solving situations and encourages students to research, analyze and evaluate economic practices and problems in our society. Students will become familiar with each of the four concepts by selecting and carrying out the provided activities and answering given research questions.

The teacher should make available basic background information and resources, some of which are provided in this kit, as well as facilitate the research learning process. At the conclusion of the research, it is suggested that each child or group, working on a specific concept, come together to share what they have learned.

After this sharing period, the students may then pursue an extended independent study based on interest, regarding economic principles.

ECONOMICS: Money

Overview

This unit acquaints students with money and its history, foreign exchange, banking saving, spending, checking accounts, inflation.

Objectives

- ☐ Students will learn about the theory of inflation and apply it to the economy.
- ☐ Students will learn about basic banking procedure, including savings, interest, loans, checking accounts, etc. and apply it to the economy.
- ☐ Students will be briefly exposed to the history and theory of money as a medium of exchange.
- ☐ Students will understand the status of money in terms of foreign exchange and compare it to current U.S. value.
- ☐ Students will use the following activities to carry out the above objectives:

1. Trace the history of money. Make a time-line to illustrate the progression of various mediums of exchange.

2. A Play: *Barter and Money*

   This play dramatizes the money concepts described in the first section. The play emphasizes the idea of barter and money within a multicultural setting. Find out what the Mayan Indian used for money. How do Mr. Native and Son use their twelve foot Yap stone? Read the play and collect costumes and props needed for each character. Select the actors. On with the show!

3. Development of Work

   With the existence of millions of people, great resources, power and wealth, we still must work for a living. With the advent of new tools and ideas, great progress has been made, but a basic formula remains the same. The following equation, developed by the American Economic Foundation, states: Man's material welfare or standard of living equals natural resources plus human energy multiplied by the efficiency of tools. Examples of tools are machines, money, and education.

MMW	**=NR**	**+HE**	**xxT**
Man's Material Welfare	Natural Resources	Human Energy	Tools

4. Account for Your Money. . . . at any cost!

Take money from your allowance, *earnings* or savings. How much money do you spend each week? What is your weekly cost of living?

What do you need?	**What do you want?**
Food	toys
clothing	books
housing	vacations
transportation	candy bars

Can some people's wants be another person's needs?

Is entertainment a want or a need?

What is the difference between bills to buy and bills to pay?

Spending money wisely is deciding what is needed and what is wanted. How much money did you spend on what you needed? How much money did you spend on what you wanted?

ACTIVITIES

Money

1. You will be given a tax free check which can be used for anything you wish. Decide what you will do with the money and write a short story about this, indicating your reasons for making that choice.
2. Complete the thought: The day it rains hundred dollar bills, I will...

   List all the things you would do as a result of this unusual happening.
3. Dramatize a conversation between the president, business leaders and economic advisers, concerning inflation and possible remedies.
4. Think about all the possible ways you can make money. List your ideas.
5. Trace the history of money. Make a timeline to illustrate the progression of the various mediums of exchange.
6. The bank has asked you to select three prizes to be given to people opening new savings accounts—one for depositing $25.00, one for depositing $50.00 and one for depositing $100.00.
7. Design a new and unusual prize to attract customers.

Inflation: *Money*

1. How has inflation affected your school? Take a survey.
2. Investigate the effect inflation has on farmers.
3. Interview friends, teachers and parents to determine the effect inflation has on our economy.
4. In an editorial, critique government spending.
5. Write a story about how to relieve inflation and present it to your class.
6. Create a political cartoon on inflation. Organize a debate with students, taking opposite positions on fights.
7. Organize a debate with students, taking opposite positions on fighting inflation.
8. Research the following:

a. Who controls inflation?

b. How does government spending on defense affect inflation?

Foreign Exchange

1. Every country has its own unit of money. Find out what the current value of the dollar is in various countries and explain how it has influenced the economy of that country as well as our own.

2. Historically, only material objects have been accepted as money. The materials may range from tobacco, wampum and cigarettes to the Yap stones, but only gold, silver and copper have enjoyed universal acceptance. If you were the director of the outer space mint, what unit of money would you use as your standard?

Money Museum

Gather samples or illustrations of early money to put on display. Research the ancient types of money. For example, the tribesmen in Northeastern Australia used the feathers of jungle birds for their money. Discuss the advantages of each type. Will it break or melt? Is it too big or small? Why are paper money and coins more practical today?

Money: *Banking It*

1. For Safe Keeping: Create a maximum security system to reduce the likelihood of a bank robbery.

2. Novelty Banks: Design a new and unusual bank. Sketch your bank on a blueprint and attach instructions and explanations of how the money in the bank is handled. Create different services the bank would offer.

3. The Golden Rule: Over a doorway in an old Dutch banking house is this inscription in French, "The Golden Age is the age in which gold does not rule." What is the significance of this quotation and how does it apply to banking?

4. Teller Talk: Bank tellers pay out, receive and keep records of money by using a passbook. Tellers can be people or machines. Some banks have twenty-four hour mechanical tellers. To deposit or withdraw the money, one pushes a button and the machine computes the balance. Devise a new and unusual method to deposit and withdraw money from a bank of the future.

INFLATION - PUBLIC ENEMY #1

OBJECTIVE The gifted student will study and evaluate the concept of inflation as an increase of the currency in circulation or a marked expansion of credit resulting in a fall in currency value and a sharp rise in prices.

Research Questions

1. Discuss with your parents how inflation has directly affected you (what your allowance buys today).
2. How has inflation affected your family?
3. How has inflation affected your school (budgets, sports, transportation)?
4. Following discussions on different income groups, explain which group is most affected by inflation.
5. Judge methods of controlling inflation presently being used by government.
6. Who can control inflation most effectively?
7. How does the government's spending affect inflation? Investigate the effect inflation has on farmers.
8. Discover the effect war has on a nation. Is it detrimental or does it balance the economy?
9. How does government spending on defense affect inflation?
10. Can policymakers curb prices without starting a new recession?

Means of Investigation

1. Research magazines such as *U. S. News and World Report*, *Nation's Business*, *Time*, *Newsweek*, etc.
2. Read current newspapers, particularly the business section of the *N.Y. Times*.
3. Study books written by economists dealing with inflation.

4. Write to the state or federal government agency for information on inflation.

5. Interview friends, teachers and local store owners to determine the effect of inflation on their economy.

6. Compare other countries. Example: France, Italy, Japan and the value of their currency.

7. Evaluate the control of government on inflation.

Report and Dissemination

1. Project the price of a week's groceries if inflation continues.
2. In an editorial, critique government spending.
3. Prepare a position paper on suggestions to relieve inflation and present it to the local government meeting and class.
4. Translate the effect of inflation on farmers and price of household food products.
5. Write an editorial stating your beliefs on inflation.
6. Explain role of the Federal Reserve Bank in nations' economics.
7. Create a political cartoon on inflation.
8. Organize a debate with students taking opposite positions on fighting inflation.

ACTIVITIES

Games

TRANSFER INCOME (Grades 5-8)

Purpose To understand that some people have less income than others.

Materials A large chart with the following information on it.

Cumulative % of Population	Cumulative % of Income Earned	% of Income Earned
10	1	1
20	4	3
30	9	5
40	15	6
50	23	8
60	33	10
70	44	11
80	56	12
90	71	15
100	100	29

Introduction to the Class

This chart shows the distribution of income for the United States. Notice that the first 10% of the population earns only 1% of the income. The next 10% together with the first 10% makes up 20% of the population and earns only 4% of the total income. This second 10% of the population accounts for 3% of the income earned. Earning 71% of the total income is 90% of the population. The 10% of the population beyond 80% accounts for a total of 15% of the income earned, and the 10% of the population which makes the highest income accounts for 29% of income earned. Since 100% of the population is thus accounted for, a 100% total income is also accounted for.

Is the distribution of income in the chart fair? Is it the responsibility of people in the upper income groups to transfer some of their income to people in lower income groups? Should the government help? Should there be income transfer? Why? If so, what form should this transfer take? The answers to each of these questions should result in expressions with differing values. Answering these questions should not only make students aware that because of scarce resources, people cannot satisfy all their wants, but also that there should be some value clarification on how scarce resources should be divided.

MONEY-MAKING PROJECT (GRADES 3-5)

Purpose To show how the cost of resources affects the price of the product.

Materials None

Introduction to the Class

The teacher should ask the students to listen carefully to the following story and tell them that they will be asked questions about it.

> The Boy Scouts of Troop 112 have decided to build and sell birdhouses for their money-making project. They plan to use the money in the troop treasury to purchase the materials they need to build the birdhouses. They will borrow or rent the tools such as hammers, saws and drills. They will buy nails, lumber and paints with the money in the treasury.
>
> Their biggest problem will come when they try to decide which kind of lumber to use. They have narrowed their choices to three: pine, walnut and plywood. If pine were used, they could sell the product for less. If walnut were used, the birdhouses would be more attractive and durable, but would cost more. Plywood would be durable, less attractive but cost less. How can the boys resolve this problem? Here are some questions that may help in the decision.

Must the selling price of the birdhouses be taken into consideration when deciding which wood to use?

Would walnut birdhouses sell for more than plywood ones? Pine?

Does the type of material (resource) used help to determine the price people will pay for a product?

4. How would you determine the price at which to sell the birdhouses (materials, labor, time)?

5. On what basis should the Boy Scouts determine which wood to use? (They might decide to use that wood which is most desirable and attractive so they could earn more money.)

6. Which type of wood would you use?

SPENDING MONEY (Grades 2-4)

Purpose	To illustrate what factors affect prices producers can charge.
Materials	One pencil and one eraser for each student and 10 cents worth of play money for each student

Introduction to the Class

1. The teacher should choose two students to be sellers—one to sell pencils and the other, erasers. The teacher should then give the rest of the students. 10 cents in play money to buy either a pencil or eraser. If the student does not have enough money to buy both, he or she must make a choice. The teacher then gives the students time to sell and buy, counts the number that bought pencils and that bought erasers, and shows the results on the board.

2. Ask the students if one product was easier to sell and, if so why. (Because of consumer preferences, some students might have preferred one item to the other. If the pencils had erasers on them, the students might have purchased the pencils because the students might not have needed another eraser. However, if the students already had a large supple of pencils, they might have purchased an eraser to complement the pencils. What is purchased, thus depends on what the students need.)

3. What would happen if the price of the product dropped to five cents? (More products could be purchased: two pencils, two erasers or one of each for the 10 cents each student has.)

4. Two factors that went into the price in this exercise were need and the amounts of the product sold.

Variations and Related Ideas

Instead of lowering the prices, raise them. Charge five cents for the pencils and erasers at first, then raise the price to 10 cents each.

Construct some other products such as ice cream cones and milk. This time, make enough so that each student can buy three of each item. Get two students to be sellers and give each remaining student 25 cents in play money. The remaining students can buy three of anything for their 25 cents. Show results.

PART I = 50 points

Directions: Answer T (true) or F (false) in the blank.

_____1. Gold was not being used as money in the New World when the Spanish came.

_____2. The colonists often used pirate gold for money.

_____3. The Middle Ages was a long period of inflation.

_____4. "Continentals" were bills made to pay for the Revolutionary War.

_____5. Greenbacks were currency made by the Massachusetts Bay Colony.

_____6. The Constitution forbids the states from making money.

_____7. One of the ways England tried to win the Revolution was by counterfeiting U.S. money.

_____8. After the Depression a law was passed forbidding U.S. citizens to trade in their dollars for gold.

_____9. Paper was first used in India.

____10. Gresham's law says "good money drives bad money out of circulation."

____11. The Dutch were the first colonists to use wampum as money.

____12. The first mint in the colonies was privately owned.

____13. When a coin is devalued, its price is made higher than its metallic content.

____14. The colonists often used land instead of gold for security.

____15. Sound money is made of gold or silver.

____16. Virginia was the first colony to go on a sound money basis.

____17. Soft money is plentiful while the supply of hard money is not.

____18. Star notes are replacement notes.

____19. Old currency is re-minted.

____20. There is no U.S. money which does not have printed on it, "In God We Trust."

____21. All U.S. currency is made in Washington D.C.

____22. The first mint was in Boston.

____23. If you have half of a torn bill, the government will give you your money back.

____24. Bent coins can be turned in at a bank for full value.

____25. Each bill has a different serial number.

PART II = 10 points

Directions: Circle the correct letter.

1. A person who studies society and how groups get along is a:

    a. propagandist b. economist

    c. socialist d. sociologist

2. A reasonable, thinking person is what kind of person?

    a. irrational b. illogical

    c. rational d. unreasonable

3. A group of controlling ideas leading to action is a:

    a. sociology b. idealogy

    c. rationality d. system

4. If the government wants to stop inflation it could:

    a. lower interest rates b. provide more jobs

    c. raise interest rates d. raise taxes

5. If the government wants to help a depression it could:

    a. raise taxes b. create jobs

    c. raise interest rates d. cut down on government spending

Name ______________________

ECONOMICS QUIZ: Money

Directions: From the following list, pick the correct words to answer the sentences below. Put only the letter beside the sentence.

A	Egypt	L	consumption	W	wampum
B	depression	M	species	X	recession
C	commemorative	N	China	Y	incorporation
D	barter	O	Massachusetts	Z	production
E	star	P	different engravers	AA	commodity
F	hard	Q	back	BB	pennies
G	socialist	R	clad	CC	soft
H	rationalist	S	clam	DD	special paper and ink
I	"A"	T	propaganda	MM	Federal Reserve Bank
J	continental	II	"B"	NN	legal tender
EE	return to a bank	JJ	medium of exchange	OO	Virginia
FF	irrational	KK	Pine Tree Shilling	PP	distribution
GG	fin	LL	Lydia	QQ	quarters
HH	tell where you found it	U	copper	RR	sociologist
K	different serial numbers	V	inflation		

________ 1. What is aide without money called?

________ 2. What is an economic good which can be used in trade?

________ 3. A definition of money is what?

________ 4. Where were copper knives used for money?

________ 5. What was Indian money called?

________ 6. Where was the first coin made?

________ 7. The official money of a country by law is called what?

________ 8. What occurs when there is more money than goods?

________ 9. Which colony used tobacco as money?

________ 10, 11, 12. The study of the ____, _____ and ____ of goods and services is called economics.

_________ 13. A coin which has been made in limited numbers to celebrate a special event or honor a person is called what?

_________ 14. What occurs when there are too many goods and not enough money?

_________ 15. What kind of bills are replacement notes?

_________ 16, 17, 18 List three ways the government discourages counterfeiting.

_________ 19. If you do not make sense, you are said to do what?

_________ 20. One who studies societies and groups is called what?

_________ 21. What letter is on money distributed by the Boston Federal Reserve Bank?

_________ 22. A coin which is covered with less valuable metal is called what kind of coin?

_________ 23. Name a famous coin made by the colony of Massachusetts.

_________ 24. What is a dollar bill sometimes called?

_________ 25. A systematic effort to spread certain ideas is called what?

1. D
2. AA
3. JJ
4. N
5. W
6. LL
7. NN
8. V
9. OO
10. L
11. Z
12. PP
13. C
14. B
15. E
16. K
17. P
18. DD
19. FF
20. RR
21. I
22. R
23. KK
24. S
25. T

COMMODITY: Money

In 1619, since tobacco was the dominant money in the Southern colonies, the General Assembly of Virginia passed a law giving tobacco a value of three shillings a pound. It also stipulated that all honest debts must be paid in tobacco, and further ordered that any person refusing to accept it as legal tender should be liable to three years of hard labor in prison.

At first the law was accepted by the people at its face value, until some legal mind discovered that there was nothing in the law to prohibit the voluntary use of coined money in payment of debts and other contracts. Two decades later, the General Assembly added teeth to the law by prohibiting the payment of all debts and contracts in anything but tobacco. Many a person who had lived in poverty for years thrilled at the sight of row on row of money sprouting from the earth. The large landowners went in for tobacco money-raising in a big way. Great areas were cleared of forest and converted into tobacco land on which the rich loam yielded phenomenal crops. Before long storehouses, barns and even kitchens were bursting with tobacco. Everybody had riches in tobacco money, there were no poor. Little by little it was discovered that in the rush to "raise money" other crops and even livestock had been neglected. The necessities of life—food, shoes, clothing—became scarce. A haunch of venison that formerly could be purchased for three pounds of tobacco, or nine shillings, now sold for ten pounds of tobacco or thirty shillings. A bag of corn meal, a plentiful commodity in the old days, increased its value thirty times. The price of other necessary goods jumped in proportion. Soon those with the money were getting most of the available supplies. Those with the more modest tobacco patches, who thought themselves rich, were disillusioned when they went to buy. In a short time tobacco money, which had been worth two shillings a pound (half a dollar) dropped to two cents and lower.

The good colonists of those days had never heard the word "inflation" used in the economic sense, yet they suffered from the acute case of it, brought on by a condition as old as time. When there is more money than there are things to buy, the value of money drops with a thud. That is inflation. The value of commodities does not rise; it is the price that goes up. A cut of meat sells for a dollar, that is its price. It will provide two meals, that is its value. When the same cut of meat sells a week later for two dollars, its price has doubled but its value remains the same, since it still provides only two meals. When twice or ten times the price is paid for the same value, we have depression. Inflation is the father to depression, as the Virginia colonists learned to their sorrow. With tobacco money worth only two cents a pound as a result of too much tobacco, and with poverty in the midst of what was believed to be riches, petitions poured into the General Assembly pleading to have the planting of tobacco stopped, at least for a limited period. The assembly refused to take action.

Depression in full flood swept the country. Desperate men, whose families were in want, gathered in groups and muttered their discontent. Hard words developed into harder action. The night skies of Virginia glowed red with the reflected light of burning tobacco fields, as bands of reckless men raged over the countryside, setting the torch to fields and sheds.

Alarmed at the wanton destruction, the Assembly met in 1684 and passed laws that put an end to the orgy of burning. Whenever or wherever men in groups of eight or more were caught in the act of burning tobacco crops, they were judged traitors who should be condemned to death!

The crop-burning came to an end, but it was many years before good times returned to the colonies in the form of the increased value of tobacco.

While the white men of the early days were working out their economic problems with tobacco, the Indians were getting along nicely with a money system they had

777

adopted long before the pale-faces set foot on the western shores. The redskins, following the custom that primitive peoples had adopted for thousands of years, wore their wealth as adornment. The Indians made beads from shellfish which they used for money and called wampum.

Much of the shell money of the Indians came from the waters around New England and from Long Island, originally called by the Indians, "Seawanahka," which means "the island of shells." These shells still abound in their early habitats. Along the shore there are thousands of them still thriving in spite of present-day lack of value.

In this early shell money, the philosophy that money is a token of labor performed is well borne out. Only the spiral core of the shell was used for wampum, After the outer part of the shell had been broken away, the core was ground smooth and polished to dimensions of a quarter of an inch long and about the same thickness. This operation consumed an hour of labor. This gives us some idea of the value of the Indians' labor. Six wampum beads were worth an English penny.

Although the word wampum was derived from the Indian word "wampi," meaning white, the beads were made from both black and white shells. Black wampum, as it was called, was really a very deep purple and had considerably more value than that made from white shells. The increased value was due to the fact that they were rarer, they were also much harder and, therefore, much more difficult to grind and polish.

Many tribes wove the wampum beads into symbolic designs and used them as belts, exchanged in inter-tribal treaties. Necklaces and broad collars of beautiful workmanship were also made of wampum and worn with ceremonial dress.

At first sight of the Indians' shell money, the white settlers smiled indulgently, as if at children, playing with beads. The Indians, on the other hand, were astonished that the white men had no standard money except beaver skins, furs, corn and tobacco. The Indians were the first to see a way out of this problem. "Why waste our valuable wampum," they reasoned, "when we can kill thousands of beavers and buy them from the white man at will?" The colonists, meanwhile, followed the same line of reasoning. Since the Indians would not sell their venison, wild fowl, fruit and herbs for beavers, there was but one course open. They would go to the beaches and flats along the shore, gather shells and make wampum.

The arrangement worked well for a while. The Indians, knowing the haunts of the beaver better than the white man, brought in prime skins that were not only acceptable, but valuable. The colonists, many of whom were skilled craftsmen, soon mastered the art of making wampum that was of better quality than that made by the Indians. The white man's wampum was so acceptable to the neighboring tribes that the production of wampum developed into an industry of considerable size. Eventually the northern colonists adopted the shell money as their medium of exchange. They found it much more convenient than beaver skins. Besides, the continuous slaughter of the little animals was bringing about a scarcity.

Not content with taking the making of wampum out of the hands of the Indians, the lust for wealth prompted many to go into the business of counterfeiting. Inferior shells and clumsy workmanship characterized the mass production to such an extent the debased shell currency soon dropped in value and was repudiated by many.

QUESTIONS ON COMMODITY MONEY

1. What is legal tender?

____

2. What did everyone do when tobacco was made legal tender?

____

3. What did this do to the value of money? Why?

____

4. What is inflation? Depression?

____

5. How did colonists try the value of money?

____

6. Why did wampum have value time?

____

7. What effect did colonists, making wampum, have on value?

____

8. What is a counterfeit?

____

SURVIVAL SKILL: Using a Checking Account

Signature Card and Identification Card

Alex wants to open a checking account. She wants to buy some things and pay for them with checks so that she will have permanent records of payment.

When you open a checking account at a bank, you fill out a signature card the same way that you do for a savings account.

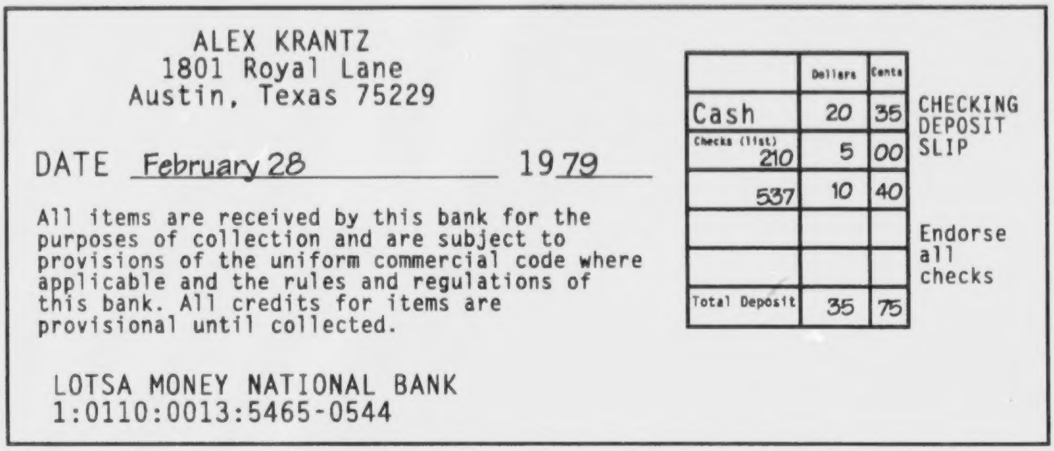
When you have filled out the signature card, you will be given an identification card, or ID. This shows your name and account number and sometimes your address and signature. When you want to cash a check, the teller may ask you to show another kind of ID, such as a driver's license, a student bus pass or a school ID. The ID must have your signature on it. The teller wants to compare your signature on the check with the one on the ID.

Deposit Slip

Most checking deposit slips look something like the one on the next page. Your name and address are printed on the top of the deposit slip. Your account number is on the bottom. On the left side of the slip, you write the date you make your deposit. On the right side, you fill in the amounts of cash and checks. For all cash amounts, you list just the total. For checks, you list each on a separate line. Before the amount of each check, write the bank number. This is the top part of the small number that looks like a fraction and is on the upper-right side of each check. (See line b on the check on page___.) Add the amounts of cash and checks. Put the total where it says "Total Deposit."

Notice that the deposit slip says "Endorse all checks." This means that you have to sign your name on the back of each check. Sign your name exactly the same way the check is made out to you.

Look at the check stub on the next page. This stub is for keeping track of the money in your checking account. (Some banks give you a separate booklet instead of stubs.) Do you see the line that says "Deposited"? Line 6 is the place to list the amount you deposited. Let's say that you deposited into your account thirty-five dollars and seventy-five cents ($35.75). Add your deposit to the "Old Balance" on line 5 to get the total amount you have in the bank. The Total is $101.14.



ALEX KRANTZ
1801 Royal Lane
Austin, Texas 75229

DATE February 28 1979

All items are received by this bank for the purposes of collection and are subject to provisions of the uniform commercial code where applicable and the rules and regulations of this bank. All credits for items are provisional until collected.

LOTSA MONEY NATIONAL BANK
1:0110:0013:5465-0544

	Dollars	Cents
Cash	20	35
Checks (list) 210	5	00
537	10	40
Total Deposit	35	75

CHECKING DEPOSIT SLIP

Endorse all checks

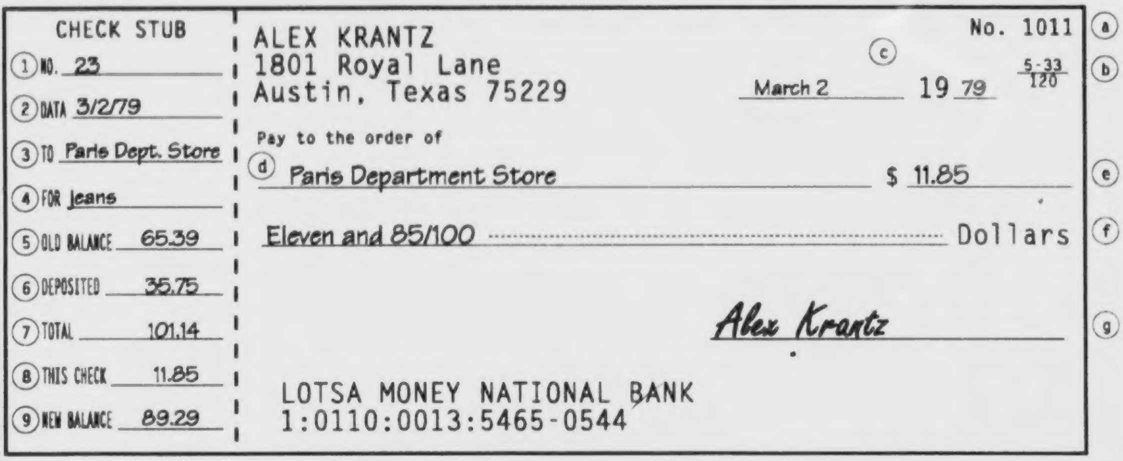
Writing a Check

Write a check clearly and in ink. Do not erase or write over what you have written. If you make an error, tear up the check. Write a new one. Fill in the check stub each time you write a check. If you do not, you may forget the amount of the check you have written, and you would be confused about your balance.

Most checks look something like the one attached to the check stub. Now let's look at how a check should be filled out. On line a, fill in the number of the check. This check is number twenty-three, the twenty-third check you have written. The date is March 2, 1979 (line c).

Suppose you are paying eleven dollars and eighty-five cents ($11.85) to Paris Department Store for a pair of jeans. Below where it says "Pay to the Order of" (line d) you write the name of the store. Notice that you show the amount in two ways (lines e and f). On the line with the dollar sign before it (line e), you print the amount of money. On the line before "Dollars" (line f), you write the dollar amount in words and show the amount of cents as a fraction. After you write the amount, draw a line from the fraction to the word "Dollars." Now sign your name on line g in the same way you signed it on the signature card.

Now fill in the items on the stub. You get most of your information from your check. Record the amount of your check where it says "This Check" (line 8). Subtract the amount of "This Check" from the "Total" (line 7) to get your "New Balance" (line 9).



CHECK STUB

① NO. 23
② DATA 3/2/79
③ TO Paris Dept. Store
④ FOR Jeans
⑤ OLD BALANCE 65.39
⑥ DEPOSITED 35.75
⑦ TOTAL 101.14
⑧ THIS CHECK 11.85
⑨ NEW BALANCE 89.29

ALEX KRANTZ
1801 Royal Lane
Austin, Texas 75229

No. 1011 ⓐ

ⓒ March 2 19 79 $\frac{5\text{-}33}{120}$ ⓑ

Pay to the order of

ⓓ Paris Department Store $ 11.85 ⓔ

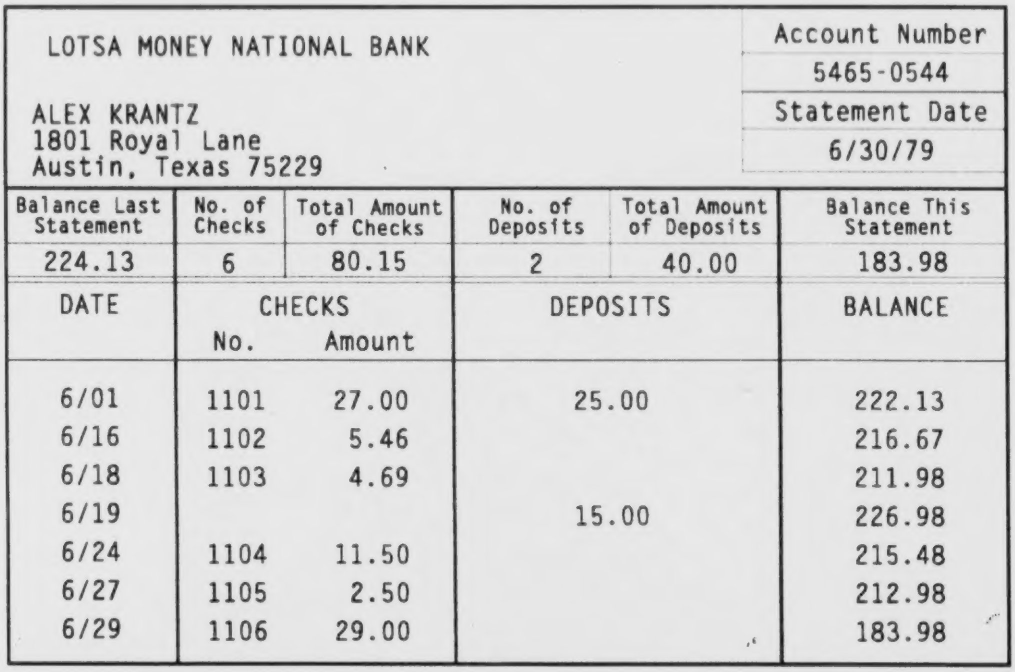
Eleven and 85/100 Dollars ⓕ

Alex Krantz ⓖ

LOTSA MONEY NATIONAL BANK
1:0110:0013:5465-0544

Reading a Bank Statement

Each month, the bank sends you a statement of your checking account. Many banks send statements that look something like the one below:



LOTSA MONEY NATIONAL BANK

ALEX KRANTZ
1801 Royal Lane
Austin, Texas 75229

Account Number
5465-0544

Statement Date
6/30/79

Balance Last Statement	No. of Checks	Total Amount of Checks	No. of Deposits	Total Amount of Deposits	Balance This Statement
224.13	6	80.15	2	40.00	183.98

DATE	CHECKS No.	CHECKS Amount	DEPOSITS	BALANCE
6/01	1101	27.00	25.00	222.13
6/16	1102	5.46		216.67
6/18	1103	4.69		211.98
6/19			15.00	226.98
6/24	1104	11.50		215.48
6/27	1105	2.50		212.98
6/29	1106	29.00		183.98

On the upper-right side of the statement are your account number and the date of the statement. Read the titles of the six boxes that follow. The first box tells what the balance was at the time of your last statement. The next two boxes tell how many checks you wrote that the bank has received and the amount they totaled. In the fourth and fifth boxes, you see how many deposits you made and what the total amount of deposits was. The last box gives your new balance.

Read the titles of each column below the boxes. For each entry, the date, the check number and its amount and/or the deposit amount, and the balance are given.

To make sure that the balance on your statement agrees with the "New Balance" on your last check stub, add to the statement balance any deposits that you have made but do not appear on your statement. Subtract from this amount any checks you wrote but do not appear on your statement. (If your bank pays interest, add this to the balance on your check stub. It your bank has a service charge, subtract this amount from the balance on your stub.) Now, the balance on your check stub and the one on your statement should be the same.

Now use the deposit slip, the check and stub and the bank statement to answer each of the following questions. Use a separate piece of paper. Write the number of each question and the letter of the correct answer.

LOAN APPLICATION
1500
CD
Travelers Cheques
20
REGULAR SAVINGS

1. You are depositing $22.00 in your checking account. You have two one-dollar bills and two ten-dollar checks.

   How should you show the amounts on the right side of your checking deposit slip?

   a.

Cash	$1.00
	$1.00
Checks	$10.00
	$10.00

   b.

Cash	$2.00
Checks	$20.00

   c.

Cash	Two and 00/100
Checks	Twenty and 00/100

   d.

Cash	$2.00
Checks	$10.00
	$10.00

2. You have $48.71 in your checking account. You have just deposited $20.00. You write this amount on the "Deposited" line of your check stub. On which line of the stub should you write your new total?

   a. Total (line 7) b. New Balance (line 9)

   c. This Check (line 8) d. Old Balance (line 5)

3. Leslie Small is writing a check to pay for a shirt he bought at Al's Sport Shop. What should he write on the line beginning "Pay to the Order of?"

   a. a person's name b. a store's name

   c. Cash d. Five and 95/100

4. How should you write twelve dollars and ninety-two cents ($12.92) on the line on a check with the dollar sign before it?

a. $12 and 92/100 b. Twelve and 92/100

c. $1292.00 d. $12.92

5. According to the bank statement, how much money was in your account before check 56 was written?

a. 211.98 b. 215.48

c. 226.98 d. 224.13

A PLAY

Barter and Money

Props needed:

- Costumes from different countries
- Poster for Paper and Coins
- Bundle of prepackaged checks and checkbook register, from tear sheets 7 and 8

Scene 1

Action takes place inside the International Emporium, a store with a great variety of national and international goods for sale. Mr. Storekeeper has just opened his doors and is seated behind the counter as the early morning customers come rushing in. The customers shout out their various offers so quickly that Mr. Storekeeper has no chance to respond at all. His facial expressions show utter confusion at their varied requests.

Customer from China: I want to buy five yards of fine silk. Do I have enough tea in this bag to buy it?

Mayan Indian: Here is a sack of cacao beans. Do I have enough for that turquoise bracelet in the window?

Alaskan Indian: I have many fine fish-hooks here. How many will it take to buy a sealskin coat?

Tahitian native: I have many necklaces of shells. I need two yards of blue and red fabric to make a new Pareu.

Customer from India: I bring an armload of coconuts. I want to buy a camel skin lamp for my home.

African native: I will give you my elephant hair bracelet to bring you good luck if I can have those earrings on the counter.

Native from Fiji: Here is a fistful of whale's teeth. I want to buy a canoe, but your canoes are so expensive. I remember when I could buy a canoe with just one whale's tooth!

Mr. Native and Son from the West Pacific come into the store dragging a Yap stone that is twelve feet in diameter.

Mr. Native: Mr. Storekeeper, the *Yap* stone is used to trade for pigs, a thousand coconuts and other things. We have another *Yap* stone outside and want to go into business. Will you take the two Yap stones for your store?

Finally, Mr. Storekeeper, so overwhelmed by these unusual requests, has his chance to talk.

Mr. Storekeeper: Look, one day about 3000 years ago, the king of an ancient Asian country called Lydia made a law that the government would issue money—coins and paper money—just like today. In our country, if anybody tries to make or use their own money or coins that person goes straight to jail, but you can use a check or credit card. A check is like a letter to the bank. It tells the bank to give some of your money to someone else. But, don't forget you can use a check only if you have money in the bank. By using a credit card, you pay later, not right away. Don't forget, you're not getting something free. In fact, sometimes you have to pay extra for extended credit. Now, here's how I make a deal. You can buy things in my store if you have the following: money (coins or bills), checks or a credit card. These are the only kinds of money that can be used in our country to buy goods or services. If I accepted your Yap stones, what would I use for money to buy goods for my store? Do you think that anyone would accept a Yap stone as payment from me? If all you people want to barter, you'll have to do it elsewhere. Remember, if you want to buy something here you will need, money. Have you noticed the poster next to the cash register?

(Use the tearsheet following the play to make a poster.)

Scene 2

Action takes place inside the Community Bank. Mr. Native and Son enter dragging their Yap stones. They approach Mrs. Lucy at New Accounts.

Mrs. Lucy: (staring at the huge stones)

Do you want the building supervisor or repair service?

Mr. Native: We came here to get money in exchange for the Yap stones.

Mrs. Lucy: I can't believe this! We cannot accept these Yap stones as legal tender. Please remove the stones immediately.

Mr. Native: (very upset)

What do you mean by legal tender? We just want to open a checking account.

Mrs. Lucy: I need money, coins or a check. A Yap stone will not do!

Mr. Native: (very confused at this point)

How can we get this money that we keep hearing about?

Mrs. Lucy: (thinks, then, speaking patiently)

Don't you think that you could sell your Yap stones to a mason? You can't trade them. You need to sell the stones to receive money. By the way, how many of these Yap stones do you have? The more you have, the more money you will get. Good luck I hope you can sell your stones. Please come to the bank later with your money. Then we will be happy to open your new checking account.

Scene 3

Action takes place in front of a large masonry yard in the center of town. Mr. Native and Son are pulling the Yap stones, interrupting traffic, and causing a rather riotous reaction on the street. They manage to drag them inside the masonry yard.

Mr. Native: (to the Mason)

We have some Yap stones. Can you buy them? We need the money.

Mason: Yap stones! Do they talk?

Mr. Native: No, they are very valuable, quality stones that we have carried from the Pacific Islands.

Mason: Yes, these Yap stones may be of value if I can use them for fireplaces, statues or waterfalls.

The Mason weighs the Yap stones and evaluates their quality.

Mason: They are valuable to me. I will give you the money in exchange for them. (The Mason gives the Natives money.)

Mr. Native: (to his son, joyfully)

Let's go straight to the bank and open a checking account.

Scene 4

Action takes place back at the Community Bank.

Mr. Native: Mrs. Lucy, here is our money.

Mrs. Lucy: Thank you (she carefully counts it). I will open a checking account for you. May I see your identification?

The Natives hand her identification.

Mrs. Lucy picks up a bundle of prepackaged checks and a checkbook register.

Mrs. Lucy: I will explain to you how to use a checking account.

Scene 5

Action takes place back at the International Emporium.

Mr. Storekeeper: (looking up and recognizing the two Natives)

Oh, I see you are back!

Mr. Native: Yes we have our checking account at the Community Bank. Now will you sell us your store?

Mr. Storekeeper: How much money do you have?

Mr. Native: (intensely writing check)

Here is our check.

Mr. Storekeeper: (astonished)

I'm very sorry, sirs, my store is worth three times that amount, but you may purchase things at my store (pauses). On second thought, because you have demonstrated such ambition, industry and initiative, I have positions open for the two of you as clerks. This way, you can learn the trade. Maybe someday you can even become partners!

Mr. Storekeeper shakes hands with the two Natives. All are happy with this new situation.

END

FACTORS WHICH AFFECT OUR CHOICES

PROJECT SAGE

BEST COPY AVAILABLE

HOW WE DECIDE

Grades 3-4

OVERVIEW

One of the major focuses in the third grade social studies curriculum is that of diversity and freedom of choice. It is important for young children to become aware of: their ability to make choices, their right to make choices, and their perceptions of how to make choices. It should be the goal of all teachers to help these children better understand who they are. The main theme of this unit is the concept of self-identity as it relates to an individual's choices. Each child comes to school with a unique set of abilities, experiences, feelings and values. It is the goal of this unit to unlock these facets for each child and help each child more fully define his or her self-concept. These unique factors contribute to each individual's choice-making process. These factors change as the child grows and changes, and this can cause choices to change as well. Only when a child has an understanding of how to make choices can he or she begin to understand the diversity of choices that are made by various groups within our society and by different cultures within our world.

The activities in this unit will provide the students with the opportunity to grasp the concepts and generalizations which are basic to the unit. There are also many activities included which will permit individual students to enrich their learnings and improve their higher- level thinking skills. The processes and questions in each lesson follow a sequential development—from the lower level thinking skills of knowledge, comprehension and application to the higher level skills of analysis, synthesis and evaluation (Bloom's Taxonomy).

The primary objective of differentiating the learnings in this unit is to provide the opportunity for students to develop their intellectual and effectual processes and to guide them towards creative thinking.

ACTIVITIES

1. Collect pictures from magazines and newspapers and make a scrapbook about your abilities. Write a description of one of your abilities on each page.

2. Make drawings on cardboard of things you can and like to do. Cut these out and make a mobile to hang over your desk. Discuss different abilities with your classmates.

*3. Make your own word search puzzle from the data you collected about jobs. Example: a puzzle using occupations of people who are good at science.

4. Collect pictures or draw pictures of people doing different jobs. Make a bulletin board using the headings of the categories used in the class survey project. Put the pictures under the right heading.

   - What people can do if they are good at writing.
   - What people can do if they are good at science.
   - What people can do if they are good at working with tools.
   - What people can do if they are good at getting along with others.
   - What people can do if they are good at playing games.

*5. Explore various career opportunities with Milton Bradley's game of *Careers*.

*6. A student may research a career that he or she is interested in as a future career. Have the student interview people in that field to determine why those people chose to go into that field. The student may also:

   *Analyze the abilities which one must have to do the best job in that occupation. (analysis)

   *Develop a plan to obtain personal career goals. What must he or she do to determine whether that career choice will be a good one?

7. Provide the following books for the students to read.

   - Asch, F. & Asch, J. (1975). *Running with Rachel*. New York: Dial Press.
   - Bottner, B. (1977). *Doing the Toledo*. New York: Four Winds Press.
   - Lasker, J. (1974). *He's My Brother*. Chicago: Albert Whitman and Co.
   - Mendoza, G. & Secunda, S. (1975). *What I Want To Be When I Grow Up*. New York: Simon and Schuster.
   - Oxford University Press Series, *Career Stories*.

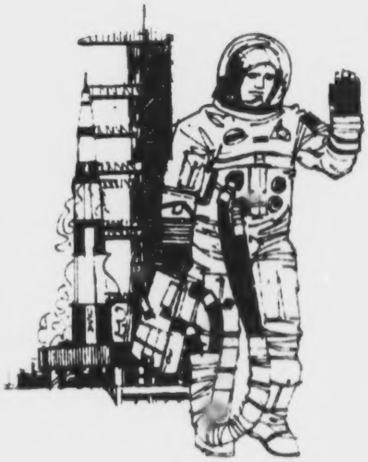
*Higher level thinking skills are involved.

Name ____________________

CAREER SEARCH
What I Can Do If I Am Good in Math

Directions: Use the list below to help you solve the word search. The words go across, down and diagonally.

accountant
artist
astronaut
astronomer
baker
buyer
carpenter
chef
clerk
coach
economist
engineer
farmer
pilot
teller
writer



A S T R O N A U T C O Z S O
C W F A R M E R M C N H O C
C R B P B A K E R H R T E A
O I V U B D T C L E R K N R
U T F S Y P M O S F A W G P
N E O T U E V N U J R H I E
T R S T T W R O F Q T Y N N
A S T R O N O M E R I M E T
N W O H B H R I T Y S V E E
T E L L E R X S D Y T Q R R
H U Q P I L O T C O A C H P

What career have you chosen for when you grow up? ____________________

Why did you choose that career? ____________________

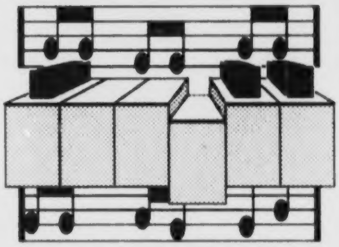
____

Name ____________________

EVERYONE IS GOOD AT SOMETHING

What do you think you have the ability to do well? Can you ride a bicycle, swim or bat a ball? Maybe you are good at helping your parents do things around the house or babysitting with small children. Whatever you feel you are good at, draw a picture of yourself doing it.

IMPORTANT PEOPLE
WITH
IMPORTANT ABILITIES



You have important people in your life. Who in your room or school would be most likely to do each of these things? What abilities do they have that would help them do these things?

1. Compose a symphony ______
2. Write a book ______
3. Break a sports record ______
4. Fly to the moon ______
5. Make a scientific discovery ______
6. Be the President of the U.S. ______
7. Be a famous actor or actress ______
8. Be a leading fashion designer ______
9. Design and make space vehicles ______
10. Be a famous artist ______

Other important things which you can predict:

ADDITIONAL ACTIVITIES

1. Discover at least one new thing that you can do. Try many new activities to discover a new ability you have.

*2. Make a profile of famous men who were scholars. Identify the abilities you have in common with these men.

3. Students or the teacher may bring resource people into the classroom to discuss how those people chose their career and what abilities they had to develop to do their job.

4. Provide the following books for the students to read:

   - Hawkinson, L. (1964). *Dance, Dance Amy-Chan*. Chicago: Albert Whitman and Co.
   - Udry, J.M. (1976). *How I Faded Away*. Chicago: Albert Whitman and Co.

*5 Interview an athlete in your class or school. Find out how this person's athletic abilities have changed over time with practice and physical growth.

*Higher level thinking skills are involved.

Name ______________________________

CHOOSE A JOB: Past, Present, and Future

Directions: Look at the list of jobs below. Decide which jobs were choices for persons living in colonial times, which are choices for persons living today and then decide which might be jobs for persons living in the future. Fill out the chart by putting the occupations underneath the correct heading. Some of the occupations will fit under more than one category. Can you think of more for each category?

astronaut
computer programmer
miller
cobbler
candle-maker
blacksmith
builder of houses on moon
tennis pro
builder of a log cabin
space shuttle driver
baker
artist
plumber
jockey
sheriff

Colonial	1981	2001

ADDITIONAL ACTIVITIES

1. Divide the class into three groups. Ask each group to write three to five sentences that relate to how a person feels about accomplishing a goal. Use some of these words and/or phrases if you wish: like, hope to, feel like, enjoy, prefer to, feel good about, think about, wish to, choose to, expect to, need to, etc.

*2. Pick an important person. Write a diary according to the way you think that person might write a diary about his or her experiences. Include that famous person's feelings about experiences in accomplishing an important goal.

*3. Write stories about animals or people who have abilities they do not realize they have. Include the experiences these characters have had which showed them their true abilities. Other students may wish to illustrate the stories.

*4. Make your story into a play. Put on a show for the rest of the class. Try making puppets for the play. Good resources for this are:

   - Razzi, J. & Craig, R. (1974). ed. *Just for Kids*. New York: Parent's Magazine Press.
   - Sattler, H.R. (1972). *Sock Craft*. New York: Lothrop, Lee & Shepard.

5. The students might enjoy reading the following book:

   - Unwin, N. (1970). *Sinbad the Cygnet*. New York: John Day.

     This story is about a baby swan who thought he did not have the ability to swim over a waterfall.

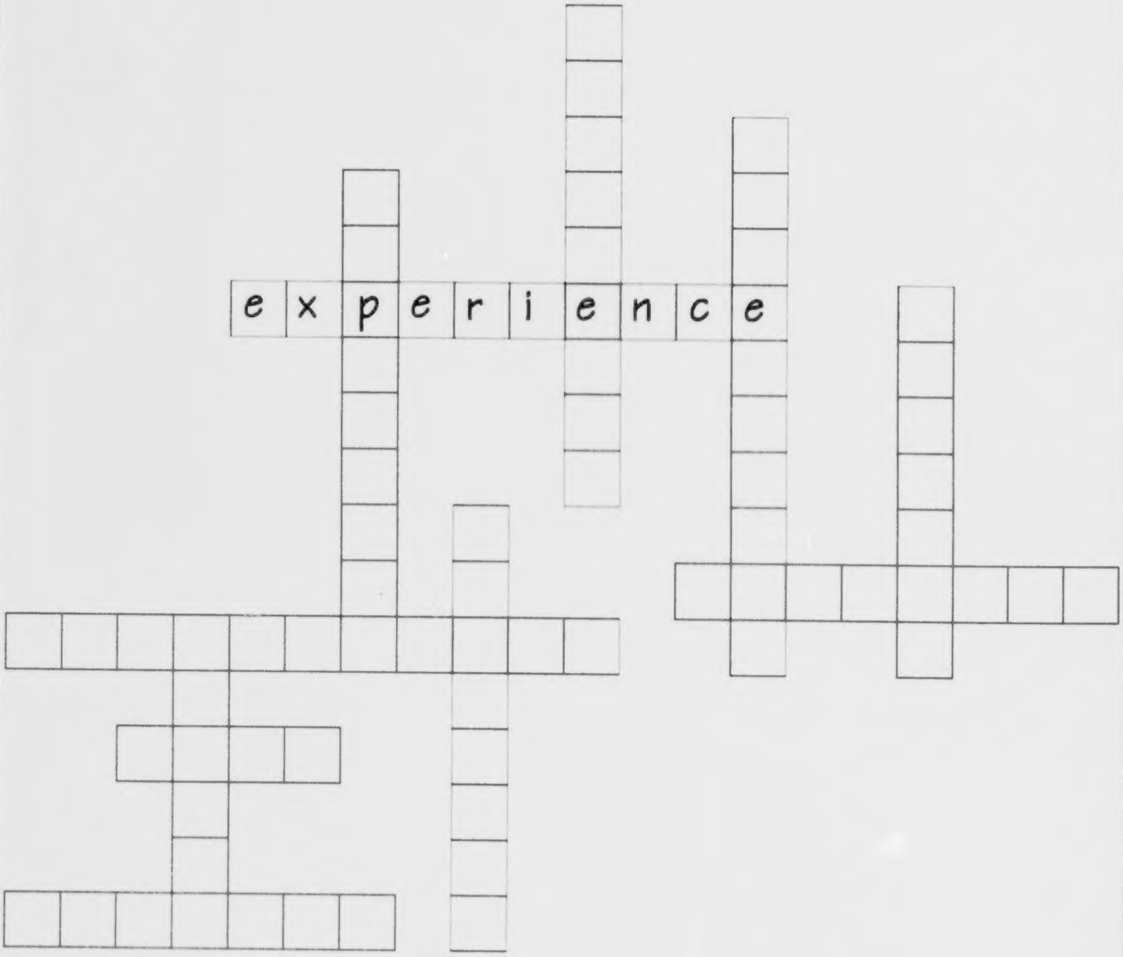
*Higher level thinking skills are involved.

DEFINE IT

Directions: Below are the definitions of the words in the puzzle. Find the word that fits the definition. The number of letters in the word is given after each definition. Then fit the words into the puzzle.

A. ability	________	doing something over and over so that you can be good at it (8)
B. choice	________	pay close attention (11)
C. concentrate	________	a strong belief in yourself and your abilities (10)
D. confidence	________	a story that has been handed down by a group of people for many years (8)
E. experience	________	to have an effect on someone without using force (9)
F. folktale	________	having to decide between 2 or more things (6)
G. generation	________	when you feel a certain way at a certain time (4)
H. important	________	soemthing that happens to you (10)
I. influence	________	people born in the same time period (10)
J. mood	________	having the skill to do something; having talent (7)
K. practice	________	to do well (7)
L. succeed	________	something that means a lot to you (9)

DEFINE IT PUZZLE


e x p e r i e n c e

ADDITIONAL ACTIVITIES

1. Read a variety of poems and express the feelings you have after reading each one. Express yourself through words, music, art or drama.

2. Delton writes an interesting book for students about this subject, telling about how a boy's feelings affect his and his mother's choices:

   - Delton, J. (1977). *Mom Hates Me In January*. Chicago: Albert Whitman and Co.

*3. Create cartoons, poems, songs or news stories that tell a story about how feelings affected a choice in your life.

*4. Read several poems by an author of your choice. Take a favorite poem (or group of poems), analyze it and identify the mood expressed by it. How does the poem make you feel? Then look at the events which occurred in that author's life at the time he or she wrote the poem. (analysis)

Evaluate whether the author's life influenced the mood reflected in the poem. Was this a good influence or not? Did the events surrounding the writing of the poem make the poem better or more meaningful? Why or why not? (evaluation)

*Higher level thinking skills are involved.

DIAMANTE POEMS

*Diamante poems express feelings or ideas in opposition to each other. As the poems progress from beginning to end, their moods change. The diamante poem is a good way to express feelings as changing and changeable. Here are some simple rules to follow and two examples of diamante poems. Can you create your own diamante poem?

- Line 1: One noun indicating a feeling or idea
- Line 2: two adjectives describing the noun in the line 1
- Line 3: three participles that describe the noun in line 1
- Line 4: four nouns loosely related in meaning to the noun in line 1 or in line 7
- Line 5: three participles that describe the noun in line 7
- Line 6: two adjectives that describe the noun in line 7
- Line 7: a noun opposite in meaning to the noun in line 1

laugh
happy, loud
smiling, joking, playing
pause, thoughts, change, dislike
frowning, trembling, hurting
sad, quiet
cry

summer,
hot, sunny
swimming, sweating, boating
clouds, storm, frost, snowflake
cold, sleety
winter

*Higher level thinking skill are involved.

ADDITIONAL ACTIVITIES

*1. Read about important people in the news. Pick one person in the news on a local or national level. Examine the ethical problems which face this person and evaluate how this person resolves these issues.

*2. Research the ethical questions faced by people in a particular career. Then lead a class discussion about the possible solution to these issues. Example: Do doctors have the right to let a patient die at the family's request?

3. Some books which the students might enjoy reading:

   - Coutant, H. (1974). *First Snow.* New York: Alfred A. Knopf.

     This is a story about a Buddhist Vietnamese girl whose family has immigrated to the U.S. From her dying grandmother, the girl learns how the Buddhists view death. In this way, a value is passed from one generation to the next.

   - Ginsburg, M. (1976). *Which Is the Best Place?* New York: Macmillan Co.

     This table conveys the idea that people make choices believing they are doing what is best; values differ from person to person.

*Higher level thinking skills are involved.

Name ______________________________

WHAT WOULD YOU PICK?

Directions: For the questions below, state your first choice by placing a 1 in the blank space next to it. Place a 2 by your second choice, and a 3 by your third choice. When you have finished, compare your choices with a friend's choices . Explain why you chose the order of importance that you did.

1. Which would you most like to have?

______ one best friend

______ many friends

______ two or three good friends

2. What should allowance be used for?

______ saving for something you want

______ spending on whatever you want at the moment

______ buying gifts for others

3. Which of these would you most like to see in your neighborhood?

______ ice cream wagon

______ a parade

______ a bookmobile

4. Who would you want most as a neighbor?

______ a teacher

______ a circus clown

______ a dentist

5. What kind of present would you most like to get?

______ a surprise present

______ a present you already know

______ a present you pick out

6. To whom would you tell a secret?

______ your friend

______ your teacher

______ your parent

Name ______________________________

DEBATE YOURSELF

Issue: Which do you value most in a friend, honesty or loyalty?

Write a paragraph to convince someone why you value honesty in a friend more than loyalty. State your reasons.

Now, take that same issue and write a paragraph explaining the other point of view; why you value loyalty in a friend more than honesty. State your reasons.

Which of the points of view that you wrote about do you really believe in? Why?

CULMINATING ACTIVITIES

These are activities designed to bring together the concepts and generalizations presented in the previous five lessons in this unit.

Using What We Know: *(for the entire class)*

We choose different things for different reasons. Most of the time, we do not think about why we choose things. To find out how you choose, try this: Make a list of 10 things you would choose to do. Then:

1. If there are things on your list that you can do well, or with much ability, write the letlter *A* next to them. (You can have more than one letter next to each item on your list.)

2. If you have had good or pleasant experiences doing any of the things on your list, write E next to them.

3. If there are things on your list that you would choose to do if you were in the mood to be outdoors, write *MO* next to those. Write *MI* next to those you choose when you are in the mood to be indoors.

4. If there are any things on your list you would choose if you are in the mood to be with other people, write *MP* next to them. If there are any you would choose if you are in the mood to be alone, write *MA* next to them.

Now look over your list carefully. Which letters do you have the most of? Do you have a lot of *A's*? Then you like to do what you are good at. And so on.

Keep a daily log of choices you make throughout the day.

*Record what factors affected your choices.

*Evaluate whether or not it was the best choice you could have made.

ADDITIONAL ACTIVITIES

1. Research the life of a famous individual. Use a variety of resource material to collect information on people such as George Washington, Susan B. Anthony, Albert Schweitzer, Albert Einstein and others. Tell how the choices they made during their lives have affected them, the lives of others from their generation and the lives of subsequent generations.

   *Decide whether this person made the best choices under his or her particular set of circumstances. (evaluation)

   *Analyze the factors that affected the choices of this person. (analysis)

   *Would you have made the same choices? (synthesis)

*Higher level thinking skills are involved.

2. If brain transplants were possible, whose brain would you choose? Remember, with the brain you will also get that person's abilities, feelings, experiences and values. Why did you select this person? How would this new brain affect the choices you would make?

*3. If you could disguise yourself as one important person, who would it be? Why did you choose this person? What would you learn if you were this person? What abilities, experiences, feelings and values would you have if you were this person? How would the kinds of choices you would make be different if you were this person?

*4. Create a dialogue with a person. Choose some dramatic point in this person's life when he or she was faced with an important choice to make.

*5. Write an article for *People Magazine* in which you interview an important person. Include this person's abilities, experiences, feelings, values and important choices.

*Higher level thinking skills are involved.

REFERENCES FOR STUDENTS

Asch, F. & Asch, J. (1975). *Running With Rachel.* New York: Dial Press.

A story about the pleasure young Rachel receives from her successful ability of running.

Bottner, B. (1977). *Doing the Toledo.* New York: Four Winds Press.

A humorous story about a girl named Genine whose acrobatic ability is the envy of the other children in the neighborhood.

Coutant, H. (1974). *First Snow.* New York: Alfred A. Knopf.

A story about a Buddhist Vietnamese girl whose family has immigrated to the U.S. From her dying grandmother, the girl learns how the Buddhists view death. In this way, a value is passes from one generation to another.

Delton, J. (1977). *Mom Hates Me in January.* Chicago: Albert Whitman and Company.

A story about how feelings affect the choices of a boy and his mother.

Ginsburg, M. (1976). *Which is the Best Place?* New York: Macmillan Co.

These fables convey the idea that people make choices believing they are doing what is best, yet they often choose differently; values differ from person to person.

Hawkinson, L. (1974). *Dance, Dance Amy-Chan.* Chicago: Albert Whitman and Co.

A Japanese-American girl learns about the culture of her ancestors. She has learned to dance the traditional ways of the Japanese.

Lasker, J. (1974). *He's My Brother.* Chicago: Albert Whitman and Co.

A boy who is a slow learner is not capable of accomplishing many activities, but is able to form deep personal relationships, enjoy music and draw.

Mendoza, G. & Secunda, S. (1975). *What I Want To Be When I Grow Up.* New York: Simon and Schuster.

A woman is humorously depicted in a variety of non-stereotypical career roles.

Razzi, J. & Craig, R. (1974). ed. *Just For Kids.* New York: Parent' Magazine Press.

Instruction for making puppets for other times.

Sattler, H. (1972). *Sock Craft.* New York: Lothrop, Lee & Shepard.

How to make puppets and other things from socks.

Undry, J.M. (1976). *How I Faded Away*. Chicago: Albert Whitman and Co.

> A boy who seemed to lack the ability to succeed in school makes the best of non-academic pursuits outside of school. He gains confidence by learning to play the recorder.

Unwin, N. (1970). *Sinbad the Cynget*. New York: John Day.

> This story is about a baby swan who thought he did not have the ability to swim over a waterfall.

Careers game by Milton Bradley.

> Oxford University Press Series, *Career Stories*.

REFERENCES FOR TEACHERS

Broadman Films, *Making Choices*. filmstrip.

Chase, W.L. & John, M.T. (1978). *A Guide for the Elementary Social Studies Teacher*. Boston: Allyn and Bacon.

Draze, D. (1978). *Pot Pourri*. San Luis Obispo, California: Dandy Lion Publishers.

Hennings, D.G., Hennings, G., & Banich, S.F. (1980). *Today's Elementary Social Studies*. Chicago: Rand McNally College Publishing.

Jantz, R. (1979). *Social Studies*. Oakland: Scott Foresman and Co.

PROBABILITY, STATISTICS AND GRAPHING

PROJECT SAGE

OVERVIEW

Many decisions we make every day are based on probability. Few situations are black and white. Most are grayish, requiring the weighing of all possible outcomes before making a decision.

In those grayish situations, it helps to find ways to uncover all the possibilities and then gauge the probability of each occurring. For example:

- Should we plan a picnic? (Weather?)
- Should I loan my bike to a friend?
- Should I study for the math test? (Can I get a good grade?)

Probability is used every day as a decision-making tool. Exploring more effective uses of this tool can only improve decision-making skills. An understanding of probability can make the difference between being a "wild guesser" and a knowledgeable risk taker.

This unit provides a general overview of the concepts of probability, statistics and graphing.

Probability is a mathematical concept used in predicting the likelihood of certain events occurring. Children may apply methods of gathering statistics, collecting and organizing facts in determining probable situations and then graphing results of experiments and surveys.

The best method of teaching the concepts of probability, statistics and graphing is through the use of hands-on activities which allow students to apply critical evaluation to problem-solving and risk-taking situations. The hands-on approach allows students the opportunity to develop the following steps:

1. Analysis of the factors in the situation.
2. Prediction of results based on the factors.
3. Performing an experiment to test the prediction.
4. Comparing the results of the actual performance with the prediction.

The unit provides different types of activities that can be presented in either a learning center or student workbook form.

Both strategies allow for individual and group investigations.

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OBJECTIVES

- ☐ Students will distinguish the difference between theoretical and empirical probability.
- ☐ Students will state event outcomes in fraction form.
- ☐ Students will apply the following techniques to solve probability problems:

-listing	-multiplication
-tree diagrams	-decreasing possibilities

- ☐ Students will utilize the equation:

$$\text{Probability (Event)} = \frac{\text{Ways a specific event can happen}}{\text{Number of total possible outcomes}}$$

- ☐ Students will collect and organize information needed to solve a problem and develop charts and graphs to clearly present results.
- ☐ Students will conduct experiments using coins, disks, dice, cards, spinners, tacks and bags.
- ☐ Students will understand how to take a random sample and conduct experiments in order to apply this concept.
- ☐ Students will understand how to conduct an opinion poll.*
- ☐ Students will conduct surveys by developing questions to ask a given sample of people.
- ☐ Students will discover how to find the mean, the median and the mode.
- ☐ Students will consider how the collection of data can assist businesses (institutions) in decision-making.
- ☐ Students will think of many situations where probability can be helpful in our daily lives.
- ☐ Students will make careful and ordered observations of facts using instruments to give reliable information.

- ☐ Students will be introduced to probability theory—a kind of mathematics which gives scientists a way of making predictions about such phenomena as the weather, and the beheavior of great numbers of people or molecules.
- ☐ Students will extend their study of probability by focusing upon a related study, such as genetics, which relies on the use of probability to determine likely chances of certain offspring.

*Students will learn how to select a random sample. Students will conduct opinion polls, asking questions to a random sample of the population. From the answers given by the sample, they can work out the general feeling of the whole population. Before accepting the opinion polls as reliable, students will examine the size of the random sample and how it was obtained.

TEACHER INTRODUCTION

A good place to begin is to ask the students the following question:

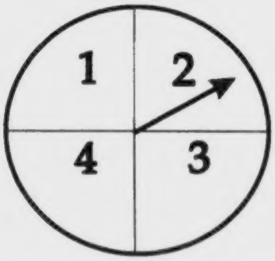
What happens if you toss a coin?

The tossing of a coin is considered an experiment in terms of probability. When you toss it, there are two possible outcomes—heads or tails. Both of these outcomes are equally likely to occur. This means that heads has one chance in two of turning up.This statement is written *Pr (heads)* = ½ and is read as, the probability of a coin turning up heads is one out of two chances or ½. The general mathematical statement looks like this:

$$\text{Probability of (Event)} = \frac{\textit{Ways a specific event can happen}}{\textit{Number of total possible outcomes}}$$

A shorter way to write this is:

$$Pr(event)=\frac{E}{N}$$



Suppose you have a spinner such as this one:

- What is the probability of spinning a 1 ?
- How many ways can you get this? (answer: 1)

- How many ways can you get this? (answer: 1)
- How many possible outcomes are there? (answer: 1, 2, 3, 4)
- Therefore, the probability statement would read: $Pr(1) = \frac{1}{4}$
- What is the probability of getting a 2, 3, or 4? (answers: ¼,¼,¼)
- What is the probability of getting a 2 or a 3 on one spin? (answer: 2/4 or ½)
- What if you use two spinners such as these?
- What is the probability of spinning a 1 on the first spin, and a 2 on the second spin?

To answer this, students will need to lay out all the possible pairs of outcomes. A chart, such as a tree diagram, is helpful.

Tree diagrams are useful when the number of possibilities is small. The multiplication method is the shortcut method to which students will be introduced. Using this method, one multiplies the possible outcomes of the first step by the possible outcomes of the second step to find the total possibilities of the experiment:

Possible outcomes on the first spinner (2)
x Possible Outcomes on the second spinner (3)

= Total Possibilities (2 x 3) =6

Using this method, if you roll two dice, how many possibilities are there? (answer: 6 x 6 = 36)

THUMBTACK TOSS

Instructions: You will need some thumbtacks. Toss about 200 handfuls of the tacks (200 throws). Keep a record of how many tacks you toss and how many tacks land point up.

Find a partner so you can get your information faster.

How many of your tacks landed point up?

What is your prediction for the next tack that you toss?

Now, try the same experiment again. Compare your two results. Will they be close? How close?

CUBOCTAHEDRON

You will need a cuboctahedron. You can build one with light cardboard or oaktag. Trace the plan onto paper and glue it onto the cardboard. Then, cut out the figure. Fold along the dotted lines. Now carefully tape the cuboctahedron together.

If you roll this cuboctahedron, what is the probability that it will land on one of the triangle faces.

One way to get an answer for this question is to roll the cuboctahedron many times. Keep count of the number of times it lands on a triangle face. Roll it 100 times.

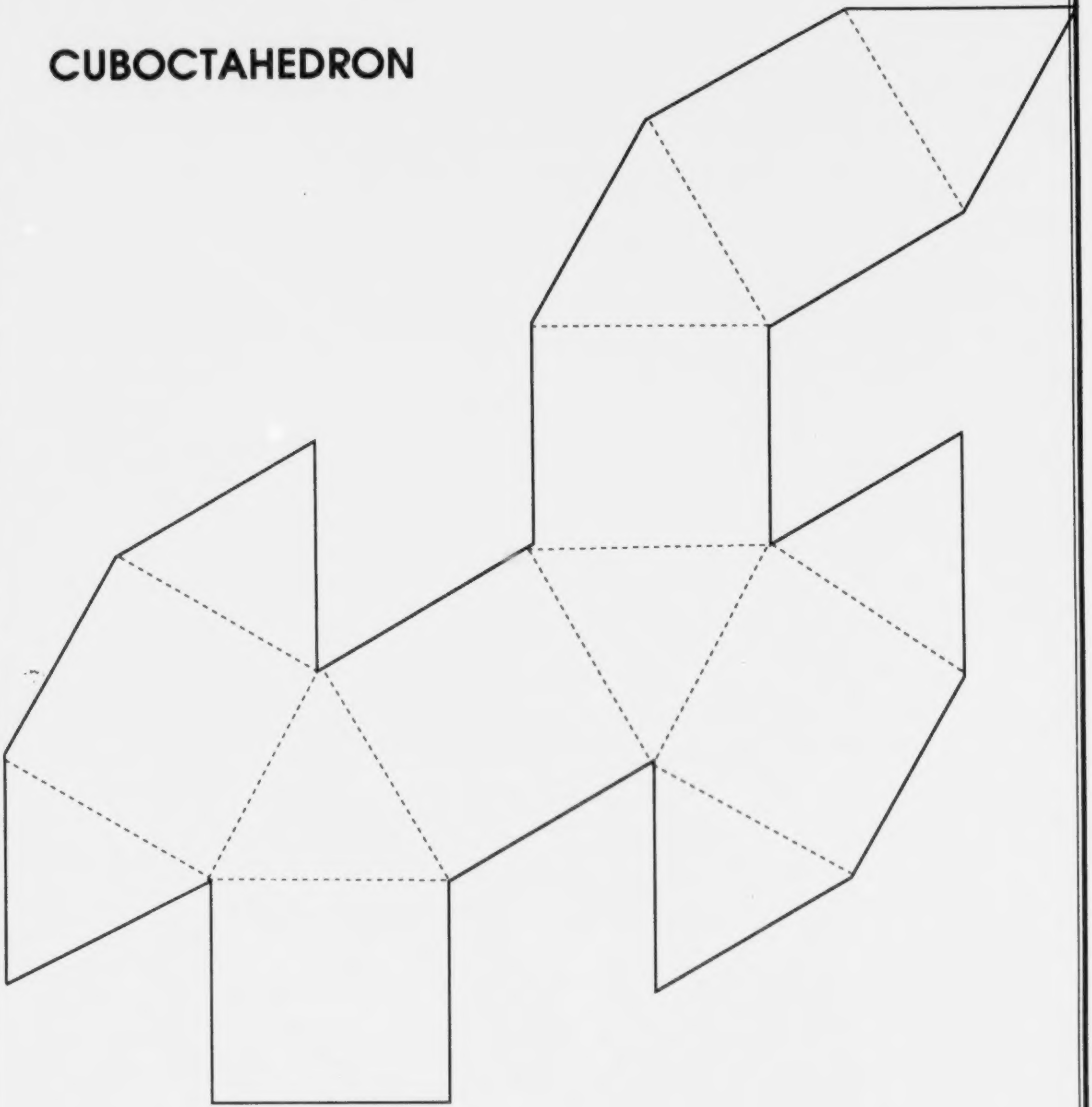
How many times did it land on a triangle? Now, roll it 100 more times. How many times did it land on a triangle?

Compare your two answers. How close are they?

I AM

A

CUBOCTAHEDRON



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COINS

In this experiment, you will be tossing 10 coins at once. There are 11 things that can happen:

O coins can land heads up.

1 coin can land heads up.

2 coins can land heads up.

3 coins can land heads up.

. . . . so on up to 10.

A mathematician would say there are 11 possible outcomes. (You may prefer to count tails. The idea is the same.)

Before you begin tossing, you should make a chart. The chart may look like this:

Heads	Count	Total

Now begin tossing the coins. Make a mark in your chart when you count the number of heads in each toss. Toss the 10 coins 200 times. Compare your record with that of a friend or friends. In what ways are your charts alike? In what ways are they different? Now see if you can use the answers you have gathered:

If you were to toss 10 coins one more time, what number of heads is most likely to turn up?

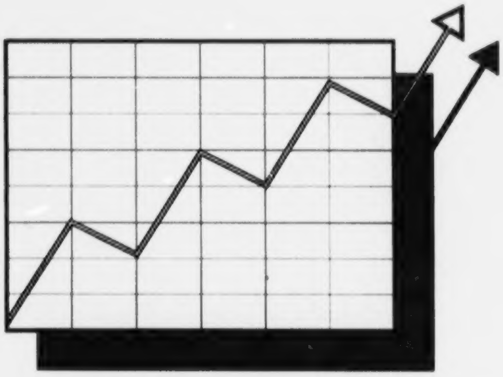
What is the probability that between three and seven heads would turn up when 10 coins are tossed?

GRAPHING

Scientists often use graphs when they show the results from experiments. Graphs change numbers into pictures.

If you have a piece of graph paper, you can make a graph for the coin-tossing experiment.

If your friends are working on this experiment, you may want to compare your graph with their graph.



Do you see why it is easier to compare graphs than to compare charts with numbers?

SAMPLING

You can experiment with sampling. For the experiment you will need:

- 50 or 60 chips of two colors
- a paper bag

Place the chips in a bag and shake them up. Now, draw out 10 chips. These are your sample. How many chips of each color are there in the sample?

Now, replace that first sample. Shake the bag, and draw another 10 chips out. What predictions can you make now, about the next chip you may draw from the bag? Is this prediction based on both of your samples? Try a few more samples of 10 chips each.

Then dump out all the chips and count the two colors. How well did your samples compare to the ratio of the colors?

Did you find that with more samples—that is, more data—your predictions about the color of the next chip improved?

The sample will not help you to predict the number of each color of chip in the bag. It will help you to predict the ratio of the numbers of the two colors. Suppose you have red chips and white chips in the bag, and the sample shows seven reds and three whites. This means you can predict, because of the sample, that about seven out of ten, or about 70 percent of the chips in the bag are red.

OPINION POLLS

Nearly two hundred million people live in the United States. It would take too long and cost too much to go around the U.S. and ask questions to everyone. Public opinion polls ask questions of a random sample of the population. They try to find out such things as the most popular television programs, people's thoughts about the important problems facing the country, and the usefulness of certain products which are sold in stores.

From the answers given by the public, pollsters can work out the general feeling of the whole population. Before the experts accept the opinion polls as reliable, however, they examine the size of the random sample, and how it was obtained.

Learn how to select a random sample. Conduct public opinion polls that ask questions to a random sample of the population. From the answers given by the sample, work out the general feeling of the whole population.

DICE

There is a great deal of fun and fascination in devising probability experiments for yourself or with your class. You may find that it is possible to work out fairly accurate information, which at first, might appear almost impossible to discover.

Devise your own experiment, using dice.

GRAPHING

1. Make a collection of bar, circle and line graphs, taken from newspapers and magazines. Write an interpretation of each kind of graph.
2. When collecting, organizing and graphing data, remember to:
    - Keep a record of the information found.
    - List the scores in order from highest to lowest.
    - Decide on the interval for their axes before writing the numbers.
    - Write numbers along left vertical edge and categories along bottom.
    - Label the numbers and categories.
    - Give a title to the graph.
    - Make a key if necessary.

STATISTICS

Statistics are a way of measuring the world we live in.

1. Take notes on advertisements on radio or television which make use of statistics. Write a report on your findings.
2. Collect examples of misuses of statistics and graphs in advertising.
3. Select one statistics assignment which consists of gathering numerical data on the following specific topics:
    - Heights of people in this class.
    - How fourth graders spend their allowances.
    - Favorite records of this class.
    - How many calories I have eaten this week.
    - How much time we spend watching TV.
    - Pets owned by members of your class.
    - Weather conditions in your school area for two weeks.
4. Make up your own statistical study.

PROBABILITY WORD CHART

Empirical Probability

Probabilities based on the frequency of different, possible outcomes of an experiment, repeated many times. In other words, based on experience.

Event

One specific outcome from a set of all possible outcomes of a situation. Finishing first in the 100 yard dash is an event.

Experiment

A situation with a defined set of specific possible outcomes. Rolling the dice to determine the number of spaces to move in MONOPOLY is an experiment.

Possibility

One of the possible outcomes of a situation. Getting a perfect score on your spelling test is a possibility.

Probability

A number value expressing the likelihood of a specific outcome for a specific event. The probability of finding a live dinosaur in your garden is 0!

Theoretical Probability

The number value used in experiments where there is a fixed number of possible outcomes —each equally possible.

When a mother cat has kittens, there are two possible outcomes for each kitten—male or female. Each is equally possible.

UNDERWATER EXPLORATION

PROJECT SAGE

OVERVIEW

Gifted and talented students should have an opportunity to explore the sea, since underwater exploration might lead to their further inquiry and discovery of new information. In studies of underwater exploration, students can encounter real problems for creative problem-solving. Based on thorough investigations, material can be used for speculations. Students can diverge from the obvious givens to wonder, what if, or suppose that, particularly when they have a good background of information and arrange data in different ways. Students may also be given an opportunity to work with experts in the field; such work can enable students to learn how to proceed the way scientists do in this area of research.

Underwater exploration encompasses the study of things related to the sea. It may include the study of organisms in the sea; the chemical make-up of sea water, nutrients or pollutants; the geology of the ocean floor; sediments found in harbors, bays and sounds; navigation and the movement of objects and organisms in and on the sea water. Activities are often extended to the study of weather, coastal zone processes and aspects of maritime history, art, music and commerce.

Teachers should enter into the learning process with their students, supplying them with library and research resources, guiding them in their research design and expressing interests in their results.

Simply exposing students to resources, however, is not enough. The teacher needs to discuss ideas and information with the student and arrange for like-minded students to meet together for mutual exchange. Scheduling individual appointments on a regular basis and structuring small group discussions are procedures which cannot be avoided. Teachers are needed, not only for resources, but also to push the student to the limits of his or her thinking.

To assist teachers with planning of initial class activities, a variety of ideas has been provided. After providing exposure to this interdisciplinary topic and providing an opportunity for students to build a storehouse of information, teachers should allow students to frame questions and design projects for independent studies.

The underwater environment has never remained static; rather, it is constantly changing. This constant change generates curiosity in any student, but it provides a challenging frontier for gifted and talented students.

ACTIVITIES

1. Why are geologists, meteorologists, and chemists concerned with oceanography?
2. How have the contributions of Jacques Cousteau assisted in underwater exploration?
3. Explain how a scuba works.
4. What do the bathysphere and bathyscaphe have in common?
5. Compare the mountainous features of the Atlantic sea floor with the landforms of the United States.
6. Investigate the advantages of nuclear submarines.
7. Describe what life would be like underwater. What would a normal day be like?
8. Explore the techniques and equipment used in gathering food from the sea.
9. Compile a list of minerals that are contained in the sea.
10. Diagram the process of off-shore oil and gas production.

EQUIPMENT

1. Investigate early undersea exploration equipment. Make a chart to depict the various types of equipment. Compare past equipment to present-day equipment.
2. Imagine that you are a deep sea diver. You are surfacing the water after a long dive. You are doubled-up with pain upon reaching the surface. What happened to you? Recall the feelings you experienced during this event.
3. Pretend you are an ocean diver. Write a story about an exciting dive you have made. Why did you make the dive? Where did the dive take place? At what depth were you? Describe what you saw and did while you were under water.
4. Design a diving suit which will allow man to reach a depth of 450 m.(1476 ft.)
5. Make a time line to show the improvements in diving apparatus from the 1500's to the present.
6. Create a diorama to analyze diving hazards.
7. Suppose you were teaching a class in scuba diving. Teach a lesson for a group of beginners.

ICEBERGS

1. Put together a mobile that combines 10 facts about icebergs.
2. Imagine you were a passenger on the Titanic. Create a skit to tell your story.
3. Construct a graph to relate the relative size of five icebergs, including the above and below water sizes.
4. Make a map of the North Atlantic. Plot the general courses of icebergs over a 12 month period.
5. Draw a chart to show how icebergs fit into the hydrologic cycle.

TSUNAMIS

1. Draw a mural to show an island village the instant before a tsunamis occurs there.
2. Collect a 20-card fact file about tsunamis.
3. Fill in a scrapbook which illustrates and keeps a record of major tsunamis, especially their causes and effects.
4. Imagine a tsunami traveling to your coastal town. It is two hours away. Keep a log of your feelings for the next three hours.
5. Decide why many people ignore warnings given by the Seismic Sea Wave Warning System. Write a skit about a tsunami warning.
6. You are a crew member of the 2700 ton research ship, Discovery. What new information were you able to find through your ocean research?
7. What are the ways an archaeological survey under water and an archaeological survey on land differ?
8. Research one of the following ruined harbors, sunken cities or shipwrecks:
    - The Harbors of Ancient Greece
    - King Herod's Great Achievement
    - The Mystery of Atlantic
    - The Wreck of Yassi Ada
    - Carthaginlan Warship
    - The Greek Amphoras of Kyrenia
    - Shave-Ziyyon (Figurines)
9. Create a new, unusual restaurant for the year 3000. Be wild! Keep in mind all the new foods that will come from the sea.
10. Suppose the ocean floor became your playground. Show all the ways your life would be different.
11. Describe the ocean to someone that is unfamiliar with it. Using puppets, think of an interesting way to express these ideas.

LAW

1. Large international mining companies are ready to begin work to recover the vast amount of minerals found in the ocean. There is one problem, however. Their aim is to make sure the whole world, not just the advanced nations, will benefit from the resources.

2. You have been placed in charge of the United Nations conference that will make laws concerning the control of the sea. What laws were made during your conference?

3. Design and create a model of a sunken ship or underwater city which would offer valuable clues to historians and archaeologists trying to piece together pictures of the past.

4. Construct the ideal underwater home. Where would it be located? What style home would it be? What type of energy source will it have?

5. Although a modern submarine carries a huge array of other electronic equipment for looking around and below the water, the periscope is still a vital piece of equipment. How would you re-design it for ocean exploration?

ABYSSAL DWELLERS

1. Solve the problem of existing at abyssal depths. Make an oral report with media to explain how fish have adapted.

2. Construct a chart, classifying the invertebrates which live in the abyssal sea.

3. Draw a mural, showing at least 10 animals which live in the abyssal depths.

4. We know that the coal, oil and gas found in the earth will not last forever. Before these resources run out, scientists should study new energy sources. Perhaps they could make a study of the kinetic and heat energy that could be harnessed from the trapping of the sun's energy and, the ocean's constant movement—its tides, waves and powerful currents.

5. Create and design the ideal invention that would generate energy from the ocean.

BATHYMETRY

1. Criticize the theory of drifting continents. Give an oral presentation, using various types of media.
2. Compare the lives of Commander Matthew Fontaine Maury and Sir Charles Wyville Thomson. Keep a ship's log about them and indicate what they contributed to oceanography.
3. Make a chart to show the following: submarine canyon, ridge, atoll, scamount, guyot and seamount with an island.

ECOLOGY

Draw pictures to illustrate the causes of water pollution

SAVE OUR SEAS!

1. How can you help stop water pollution and protect our natural environment? Design a billboard to inform the community of your ideas.
2. We have many great inventions, but some of them have helped to cause water pollution. Make a list of great inventions and tell how they are harmful or harmless to the environment.

EXPERIMENTS

How is air pumped down to a diver?

Take a piece of tube about a meter (3 ft.) long and a centimeter (1/2 in.) in diameter. Place one end just under the surface of the water in a bucket. How difficult is it to blow bubbles through the tube? Slowly lower the tube 50 cm. (20 in.). How does this compare to your last attempt?

BENDS

Very quickly, take the top off a bottle of carbonated drink. You will hardly see any bubbles. But if you shake the bottle hard, and take the top off quickly, the drink will froth all over the place. This gives you a good idea of what the "bends" is all about. The gas is dissolved in the liquid all the time—you just make it leave the liquid much more quickly by shaking the bottle. In the same way, the deep sea diver will have no problems if he or she decompresses slowly. If the diver does get the bends, he must be compressed again quickly.

What are the consequences of the bends? What is nitrogen narcosis?

INDEPENDENT STUDIES
Framing Questions and Designing Projects

One of the most important factors in the design of independent studies for students is the format of the questions that the studies will address. Questions that can be answered experimentally must be designed to challenge the students' ability to investigate. The questions must be open-ended. Generally, experimental questions do not lead to a single right answer, but to an answer that is the best at a given time — given the design of the research.

Experimental questions about underwater studies can be focused on the physical, chemical or biological components of the marine environment. For students who are most interested in the biological component, questions can focus on the cellular organismic population community or ecosystem level. Once the general area of interest has been identified, students should be challenged to design research questions that are manageable within the time frame and research capabilities available to them.

At the beginning of the independent study, an agreement must be reached with regard to the final product to be produced. It is important to evaluate the techniques employed by students in the study of their experimental problems, as well as evaluate the final product of the investigation. Many individuals involved with scientific research, and gifted and talented participants rely on the maintenance of a log of daily activities along with a laboratory manual. The log should include a summary of progress, anecdotal reports, ideas, new questions, puzzling findings, notes of parallel research efforts being carried out by others, readings, sketches and any other inclusions that fit the student's fancy. Laboratory manuals should contain the scientific stuff of the investigation. It is important that emphasis be placed on accuracy and honesty. In the laboratory manual or record book there is no room for flights of fantasy. Accuracy in reporting procedures, observations, data, analyses and conclusions is imperative.

Questions of format for the final product of the independent study investigation must be answered before the study gets underway, since those questions will influence the kind of data recorded and will help the student organize the research project. As a general rule, final reports should take the form of a research report, scientific paper or seminar.

Once the area of general investigation, the format of recording progress, and the nature of the final product have been elucidated, it is time to get on with the questioning. Students should be encouraged to develop their own mini-proposals. A proposal should:

1. define the general experimental question to be addressed.
2. state why the research question is of importance to the student.
3. define why the question is of scientific importance.
4. state specific hypotheses to be tested or research questions to be answered.

5. describe experimental or library research procedures to be followed.
6. define the timeline for the research.
7. describe the procedures to be used in the research process.
8. indicate what data will be collected.
9. In analyzing the data, define the analytical procedures that you will follow.
10. describe the format of the final research product.

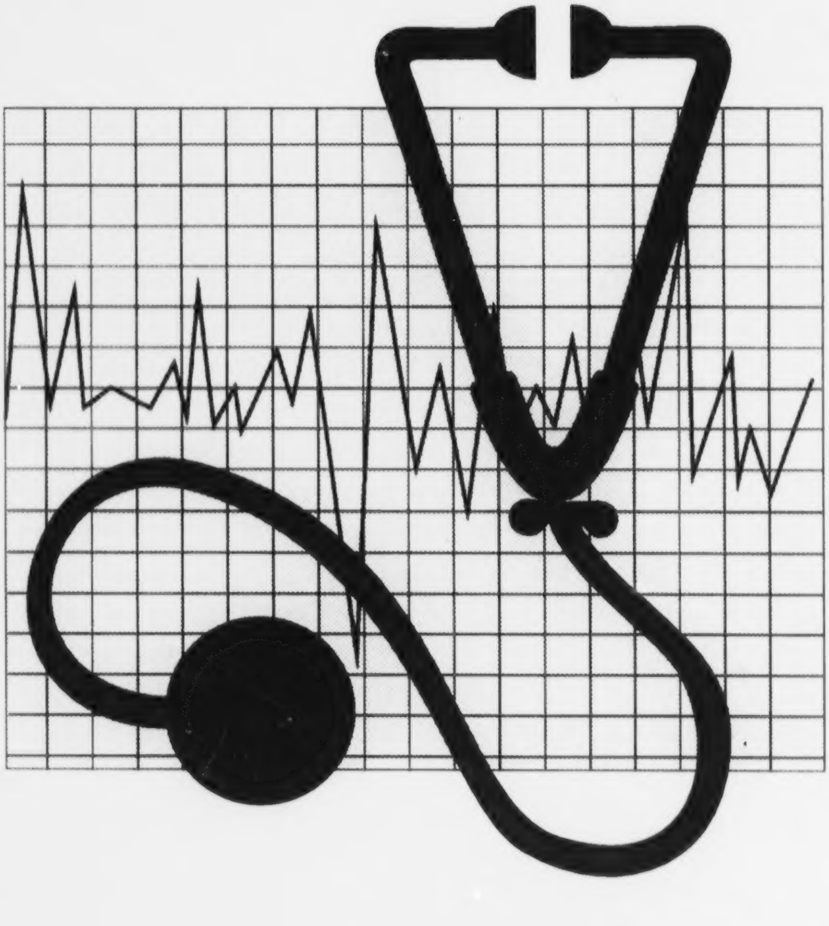
The mini-proposal forces the student to focus his or her interests, sets objectives, and frames possible questions for investigation and research. The mini-proposal writing is a technique to refine the student's questioning.

Attention should be given to the design of the study, scope of the study and the value to be derived from the activity. Carefully designed, independent study projects can help students develop their cognitive skills. In addition, these types of investigations of the underwater environment can be very helpful in improving the student's attitude toward scientific investigation and learning.

Throughout the entire study and project, the teacher and student should review the process, discuss directions, delineate information, specify problems and clarify procedures. The review process itself continues the framing and refinement of questions.

In summary, the writing of the mini-proposal and the continual review of it by teacher and student are essential techniques for framing questions and designing a project.

KEEP ON PUMPIN'



PROJECT SAGE

OVERVIEW

"Keep on Pumpin'" is a study of the heart and circulatory system and is appropriate for use on the 3rd, 4th, 5th and 6th grade levels. This mini-study unit contains a variety of activities for developing the thinking strategies of students, and includes activities such as : logic elimination, brain teasers, creativity, debating, experimental research and independent study.

Project Sage has presented the "Keep On Pumpin'" mini-study unit in a learning center. The activities were displayed in a designated section of the classroom along with all materials necessary to carry out the activities. Students worked individually and in small groups in their study of the heart and circulatory system.

GENERAL OBJECTIVES

- ☐ To acquaint students with the importance of the heart and circulatory system.
- ☐ To provide experiences for the development of thinking strategies, including logic elimination, brain teasers, creative thinking, debating, experimental research and independent study.
- ☐ To provide opportunities for students to learn about various diseases of the heart and circulatory system.
- ☐ To provide opportunities for students to learn about outstanding doctors and pioneers in the field of heart and blood research.
- ☐ To provide for students, through field trips, resource people and hands-on activities, firsthand experience concerned with different aspects of the heart and circulatory system.

HOW MUCH DO YOU KNOW ABOUT YOUR HEART?

	YES	NO
1. Do people under 40 get heart disease?		
2. Are there many kinds of heart and blood vessel diseases?		
3. If your heart sometimes skips a beat, is this a positive sign of heart disease?		
4. Do most people who have heart disease die suddenly?		
5. Do more pople die of heart disease than of any other cause?		
6. Does the height of blood pressure alone show how serious the condition is?		
7. If a baby is born with a defective heart, can anything ever be done to remedy the defect?		
8. Is it possible to have a heart murmur without having heart disease?		
9. Can rheumatic fever be prevented?		
10. Should employers refuse to hire people who are known to have heart disease?		
11. Is there a relationship between cigarette smoking and heart disease?		
12. If you get short of breath after climbing a flight of stairs, is this a positive sign of heart disease?		
13. When a person has a blood clot blocking a portion of his coronary artery (coronary thrombosis), must he/she be an invalid for the rest of his/her life?		
14. Is a pain in the left side of the chest a positive sign of heart disease?		
15. Do very fat people run a higher risk of death from heart disease?		
16. Do you know what services there are in your community for people with heart disease?		

A comparison with student responses and those presented by the Heart Association can produce a thought-provoking group discussion which should stimulate considerable interest in the mini-study. The above questions can also be used as a basis for individual and/or small group research.

Answers

1. Do people under 40 get heart disease?

Yes. People of any age may have diseases of the heart or blood vessels.

2. Are there many kinds of heart and blood vessel diseases?

Yes. There are many diseases of the heart, arteries and veins that affect, in addition to the heart, various other parts of the body such as the kidneys and brain. A few of the more common conditions are listed here:

Coronary heart disease. Coronary heart disease exists when the coronary arteries that nourish the heart become thickened and narrowed by a deposit of cholesterol and other fatty materials in the inner wall. This disease is called atherosclerosis. If the arteries become much narrowed, heart attack may follow.

Kidney damage. When the arterioles (small arteries) of the kidneys are narrowed or if they are blocked as a result of arthersclerosis, the kidneys are not able to function normally.

Hypertensive heart disease. High blood pressure may eventually affect the heart and result in hypertensive heart disease.

Rheumatic heart disease. Rheumatic fever may damage the heart valves, causing rheumatic heart disease. Although rheumatic fever is more common in childhood, many adults suffer from the resulting heart valve damage.

Congenital heart defects. Some babies are born with defective hearts. These heart defects vary as to kind and severity.

Varicose veins (swollen veins). This is an example of a common disorder of the veins. It affects the legs primarily.

3. Do most people who have heart disease die suddenly?

No. In most types of heart disease, death, when it comes, is not sudden. Many sudden deaths are wrongly blamed on heart disease.

4. If your heart sometimes skips a beat, is this a positive sign of heart disease?

No. Many people with a normal heart may sometimes feel their heart skipping a beat or beating faster or slower than usual. This skipping, however, may be a sign of heart disease. In your own case, ask your doctor.

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5. Do more people die of heart diseases than any other cause?

Yes. In the United States more people die of diseases of the heart and blood vessels than any other cause.

6. Does the height of blood pressure alone show how serious the condition is?

No. The condition of the heart and arteries and their ability to withstand the pressure are more important than the height of the blood pressure. Only a doctor can determine the patient's condition.

7. If a baby is born with a defective heart, can anything ever be done to remedy the defect?

Yes. Often surgery can help or cure the child. See your doctor.

8. Is it possible to have a heart murmur without having heart disease?

Yes. Some people with perfectly good hearts have slight murmurs. Your doctor will tell you when a murmur is a sign of heart disease.

9. Can rheumatic fever be prevented?

Yes. Doctors can usually prevent rheumatic fever by prompt and thorough treatment of streptococcal sore throats and certain other strep infections. Doctors often prescribe regular, continuous medication for patients who have had rheumatic fever to protect them against strep infections that may lead to repeat attacks of rheumatic fever.

10. Should employers refuse to hire people who are known to have heart disease?

No. If the employer checks with a physician to make sure the employee with heart disease can work at a particular job, there is no special risk.

11. Is there a relationship between cigarette smoking and heart disease?

Yes. Cigarette smokers have a higher rate of heart attack and a higher death rate from heart attack than non-smokers.

12. If you get short of breath after climbing a flight of stairs, is this a positive sign of heart disease?

No. While shortness of breath may be a sign of heart disease, there are many other troubles that can cause this symptom. If you have this symptom, see your doctor.

13. When a person has a blood clot blocking a portion of his coronary artery (coronary thrombosis) must he be an invalid for the rest of his life?

No. Many patients recover and are able to lead normally active lives.

14. Is a pain in the left side of the chest a positive sign of heart disease?

No. A pain in the left side of the chest is usually not due to heart disease, but should be checked by your physician.

15. Do very fat people run a higher risk of death from heart disease?

Yes. Studies show that people who are very fat have considerably higher death rates from heart disease.

16. Do you know what services there are in your community for people with heart disease?

If your answer is yes, award yourself a medal of merit, but do not stop there. Work with your local Heart Association to:

a. let others know what help is available.

b. improve and extend present services for people with heart diseases.

BRAIN TEASER

Hidden within this cluster of letters are two sets of words related to our mini-study. Going from left to right, select one letter from each column to spell a six-letter word in Group A and a five-letter word in Group B.

Group A

A	U	L	E	E	M
H	E	S	S	L	Y
A	R	R	A	R	L
M	T	T	C	U	K
V	T	S	L	C	W
A	O	T	I	O	E

Group B

B	R	R	N
V	U	O	E
O	L	A	E
P	E	V	D
H	A	S	T

LOGIC ELIMINATION PROBLEM

In a certain hospital the positions of cardiologist, hematologist and surgeon are held by Patterson, Saino and Turner, though not necessarily in that order.

- The surgeon, who was an only child, earns the least.
- Turner, who married Patterson's sister, earns more than the hematologist.

–

What position does each doctor hold?

THE HEART TRANSPLANT

You are the chief surgeon at a big hospital. You must make a decision about four patients in need of a heart transplant. There is just one donor. Assuming all patients could receive this heart, which one would you choose?

1. a famous brain surgeon at the height of his or her career
2. a 12-year-old musician
3. a 40-year-old lawyer
4. an expectant mother

Directions

First, make an individual choice. Then, organize yourselves in groups of four. A consensus must be reached as to who will get the heart. Then organize yourselves in groups of eight and as a group, reach a consensus again.

The final step is for the entire class to reach a consensus. If there is a difference of opinion between the last two groups, a spokesman should promote his or her group's position in hopes of convincing the other groups to concur with that position.

If there is an impasse, the activity is ended. Regardless of whether the entire class reaches consensus or not, this activity provides for much soul-searching and clarifying of one's personal beliefs and values.

Critique Questions

- What did you base your final decision on?
- Did a leader emerge in your various groups?
- Was a leader necessary?
- What conflicts arose?
- Did anyone in your group take a stand that surprised you?
- Did any of you find you were taking stands that surprised yourself?
- How did this activity help you clarify your values?
- How many of you found yourselves changing roles in order to be more persuasive?
- What are some of the things we could do to be more effective in our interpersonal relationships?

BRAIN TEASER

The letters in the word *circulatory* are written in ascending and descending order below. Try to think of the longest word for the beginning and ending letters on each line. Two points are given for each letter.

C ________________ Y

I ________________ R

R ________________ O

C ________________ T

U ________________ A

L ________________ L

A ________________ U

T ________________ C

O ________________ R

R ________________ I

Y ________________ C

CREATIVE THINKING

Create expressions that contain the words: *song*, *blood*, and *heart* . Illustrate one or more of these in a creative way. This can be in the form of cartoons, skits or other illustrations.

Starters are:

royal blood

cold blood

getting to the heart of the matter

hot-blooded

blood brother

BLOOD TYPING

Learn how to type your own blood. Invite a registered nurse to the classroom. After fingers are pricked, two drops of blood are placed on a slide for typing, using anti-A and anti-B typing sera.

Blood types can be determined by using an Ortho Blood-typing chart. Write to your local blood bank to get one.

Before a blood transfusion, doctors match the donor's blood group with patient's blood group to make sure unsafe reactions will not take place. The combination of certain blood groups causes substances in the blood to clump, or stick together. Clumping may block small blood vessels and cause the patient to become seriously ill or even die.

Safe

Blood Group of Donor	Blood Group of Patient
Group AB	Group AB
Group A	Group AB or A
Group B	Group AB or B
Group O	Group AB, A, B or O

Unsafe

Blood Group of Donor	Blood Group of Patient
Group AB	Groups A, B, or O
Group A	Groups B or O
Group B	Groups A or O

Compatibility Game

After studying the above information, take a small card, indicating a blood type (*AB, A, B, O*).

The leader starts the game by saying, "Transfuse." Find another person who would be compatible with him or her within a 30 second time limit. If done correctly, each pair (each student) gets one point. Repeat 10 times. The students with the greatest number of points, win.

ETYMOLOGY/CREATIVE ACTIVITY

Look at the following cells, including *cardi* and its word derivatives.

After the words below are defined and discussed, choose one to illustrate in a creative way.

ology	the study of
cardi	heart
meter	to measure
graph	to write
gram	to write

cardiomyopathy
cardiology
cardiotonic
cardiod
cardiotachometer

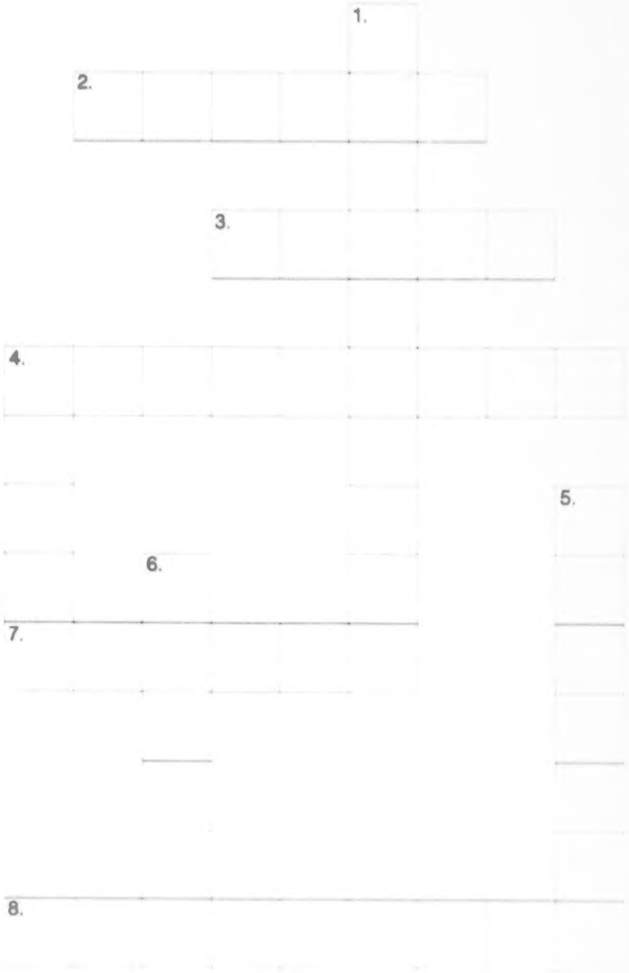
cardiopathy
cardiovascular
cardiography
carditis
cardiograph

cardiorespiratory
electrocardiograph
cardiac
cardiologist
myocardium

BRAIN TEASER

Directions: Unscramble each of the following words assocaited with the circulatory system and put them into the correct spaces in the crossword puzzle.

hniebmoolg
dobol
slecl
goexny
aalspm
sdugili
yclpraila
lesnep
stellapte

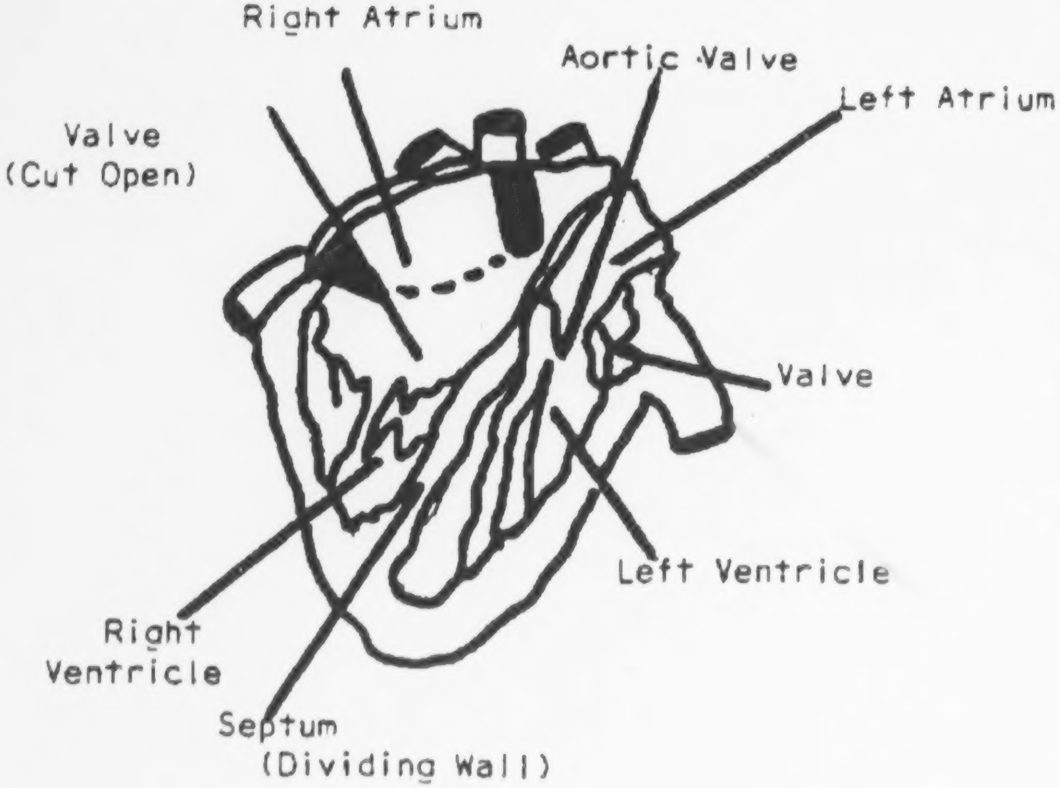


Answers:

1	down	Hemoglobin
2	across	Oxygen
3	across	Blood
4	down	Cells
4	across	Capillary
5	down	Liquids
6	down	Plasma
7	across	Spleen
8	across	Platelets

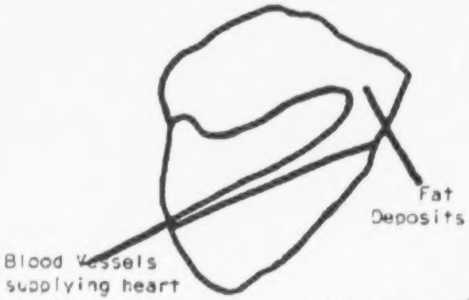
BUILDING A MODEL OF THE HEART

Build your own model of the heart and circulatory system, using clay, plaster of paris, paraffin, glass tubing, plastic tubing and colored water.

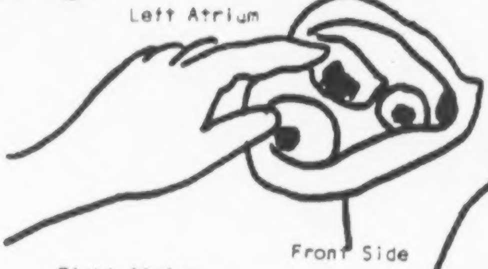

Right Atrium
Aortic Valve
Left Atrium
Valve
(Cut Open)
Valve
Left Ventricle
Right
Ventricle
Septum
(Dividing Wall)

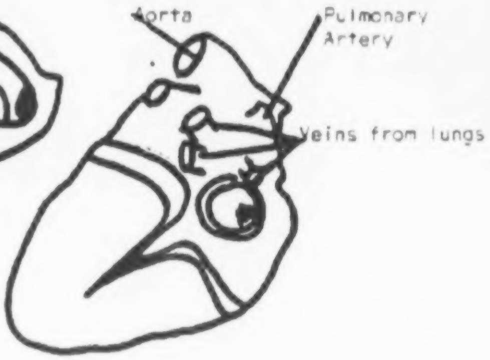
HEART DISSECTION

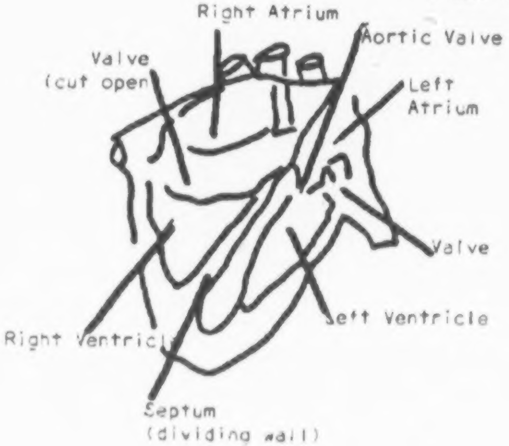
You can get a good look at the inside parts of the heart by dissecting one. A lamb heart is a good subject because it is similar in size and shape to the human model. Meat markets tend to trim all the connecting veins and arteries away. Pick one that is as intact as you can find. Look for one that is not split open.


Fat
Deposits
Blood Vessels
supplying heart
muscle

1. Find the front of the heart. The back side looks different.
2. Looking down from the top, try and identify the main blood vessels. Most likely, the butcher will have trimmed most of them away. Yours will look something like this:


Left Atrium
Front Side

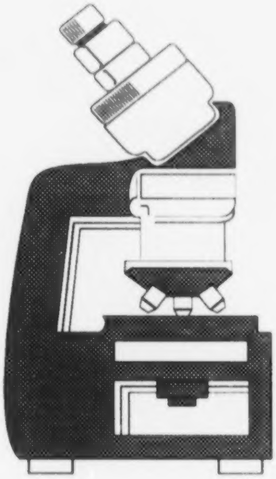

Aorta
Pulmonary
Artery
Veins from lungs


Right Atrium
Aortic Valve
Valve
(cut open
Left
Atrium
Valve
Left Ventricle
Right Ventricle
Septum
(dividing wall)

3. Slice the heart in half to see the inside. Cut slowly. Notice how things are attached before you cut them. A cleaner cut will be possible with a longer knife.

See if you can find the four chambers, the valves and the main arteries and veins.

USING MICROSCOPES



Using a microscope, view prepared slides of blood cells to observe circulation.

Also use the microscope to observe the circulation of blood in the tail of a live goldfish.

Record your observations on lab sheets.

CREATE A CARTOON

Create a cartoon to illustrate information gained from doing this study. Example: Research might reveal that anti-bodies are the reserve crew for combating diseases. They suddenly appear in the blood to protect the body from invasion by bacteria.

STRESS TEST

Cells are in constant need of oxygen and nourishment. Even while you sleep, your heart never stops pumping blood. Skate or straighten up your room, and the heart has to pump faster to supply those active body parts. Here is a way to survey how much harder you heart is working.

175							
150							
125							
100							
75							
50	Lying Down	Sitting	Hopping x25	Hopping x100	Standing	?	

1. Check your pulse after doing these activities. Give yourself some recovery time after each one. Think up some more.
2. Chart the information.

   What happens to your beat as you do more work?

   Is sitting or standing more work?

MATCHSTICK PULSE METER

Your pulse can be converted to a visual display, as the scientists say. You can easily make this pulse-watching device with a bit of clay and a matchstick.

1. Roll a ball of clay about the size of a dime. Stick a wooden match into the ball. (You can also use a thumbtack base.)
2. Place it on your wrist. Shift it around until you find the spot with the strongest beat.
3. Impress your friends. Tell them you have made a device to test cardiac beat frequency.

Ask if you can try it out on them!

TOURNIQUET

Until the seventeenth century, the experts said blood was like the tide. It oozed in all directions and went no place in particular. It was then that William Harvey, an English doctor, proved that blood circulated (moved in a circle) and was pushed by the heart. Harvey showed that blood flows through the veins in only one direction — toward the heart. You can repeat the famous physician's experiment.

1. Tie a cloth band around the upper arm so the veins stand out.
2. Press along a vein, away from the heart.
3. Lift the upper finger. does the blood run toward or away from the heart?

CAUTION: **A TOURNIQUET CAN BE DANGEROUS. DO NOT LEAVE IT ON FOR MORE THAN A MINUTE.**

UNDER YOUR TONGUE

A good place to observe living blood vessels is under your tongue. Use a mirror. A magnifying glass might also be helpful.

1. Use a mirror and a strong light to look at the underside of your tongue. Amazing, isn't it!
2. Color and size will help you identify the kinds of vessels.

   Thick blue lines mean, veins

   Thick pink lines mean, arteries

   Tiny hair-thin lines mean, capillaries
3. Another good place for seeing capillaries is in the

   fold under your eye.

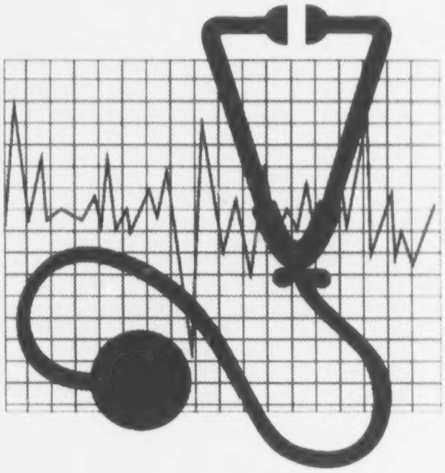
RESEARCH RESEARCH

1. Find at least one fact concerning the heart and circulatory system, using the *Almanac*.
2. Find some interesting fact on the mini-study, using the *Guinness Book of World Records*.
3. Use the *Biographical Dictionary* or some other source to find out about the contributions made by Charles Orew, Paul Dudley White, Daniel Hale Williams, William Harvey, Christian Barnard, Clara Barton. How is what they did related to this mini-study? Create a skit to share your information.
4. Use the *Reader's Guide to Periodical Literature* to find at least two current articles related to this mini-study. Read them and compose a brain teaser to share your information with the class.

STETHOSCOPE

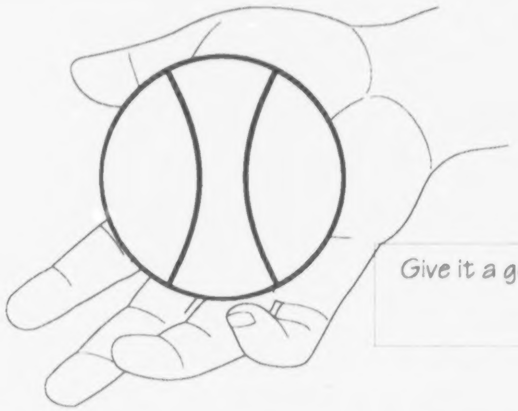
The first stethoscope was invented by a doctor in 1819. It was nothing more than a hollow tube. However, it was an improvement over the old ear-on-the-chest method — at least in some cases. You can make one with a paper tube or a sheet of rolled-up writing paper. You can also make a more modern version with a rubber tube and a funnel. Here's how:

1. You can buy rubber tubing from the hardware store. Check around the house for a funnel or use a cutaway plastic bottle.
2. Listen in a quiet place if you have trouble hearing. Try the old ear-against-the-chest method.



TENNIS BALL SQUEEZE

Try to do a heart's work with your hand. Test the ease with which you can squeeze, and get a grasp on the power of this mighty muscle.



Give it a good squeeze!

1. The force needed to squeeze a tennis ball is similar to the force needed to squeeze blood out of the heart.
2. If you squeeze 70 times a minute (the normal pulse), you will get an idea of how hard your heart works.

THE HEART AND THE CIRCULATORY SYSTEM

Directions: Figure out the relationship of the words or phrases listed below. Then draw a line under the one that does not belong.

1. A B C AB 0
2. white cells, red cells, spleen, plasma, platelets
3. anemia, leukemia, hemophilia, arthritis, phlebitis
4. Charles Drew, Jonas Salk, Christian Bernard, William Harvey, Daniel Hale Williams
5. veins, arteries, capillaries, liver
6. oxygen, carbon dioxide, waste material, perspiration, food
7. cholesterol, smoking, worrying, coughing, improper diet
8. ventricle, atrium, valve, fibula, chamber
9. atherosclerosis, coronary artery disease, stroke, appendicitis
10. blue, red, yellow, white
11. pacemaker, artificial valve, heart lung machine, dentures, clamp
12. pork chops, bacon, ham, chicken, sausage, ham hocks
13. blood bank, transplant, transfusion, donor, blood type
14. heartbroken, cold hearted, heart attack, hardened, heartless

This can also be done as a game review rather than a written lesson

Answers to Brain Teaser/Review

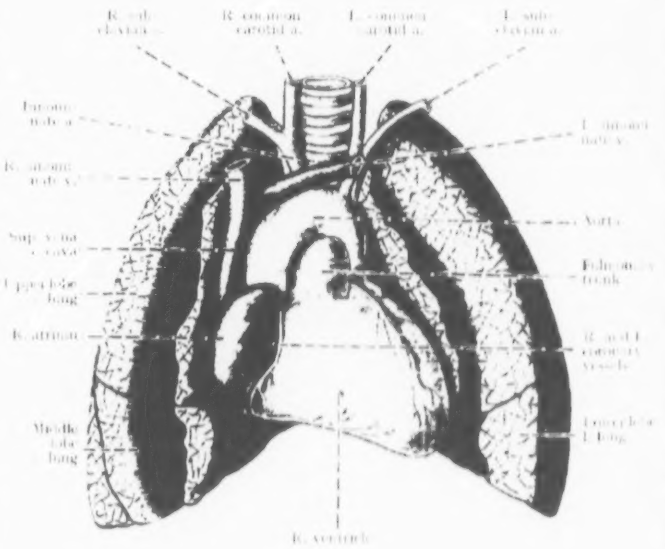
1. C	All blood types
2. spleen	All part of the blood
3. arthritis	Diseases of the blood
4. Jonas Salk	Specialists—heart/blood
5. liver	All parts of circulatory system
6. perspiration	All things transported by the blood
7. coughing	All causes of heart attacks
8. fibula	All parts of the heart
9. appendicitis	All conditions influenced by impropter flow of blood
10. yellow	Colors related to circulatory system
11. dentures	Terms related to treatment of heart or blood disorders
12. chicken	Pork meats harmful when eaten in excess
13. transplant	Terms related to blood
14. hardened	Terms illustrated in our creative activity

ABOUT YOUR HEART
AND
YOUR BLOOD STREAM

Your heart is a very strong muscle that works all the time. You can find out how big it is by putting your two fists together. Your heart lies in the middle of your chest, a little to the left.

Can you feel your heart beating now? Probably you cannot, if you are sitting still. If you run or jump up and down, you will soon notice how hard and fast your heart can beat.

Your heart must work hard to keep blood flowing through your body. All the cells of your body must have blood to live and grow. Your body is made of millions and millions of tiny cells.


R. subclavian a.
R. common carotid a.
L. common carotid a.
L. subclavian a.
Innominate a.
L. innominate v.
R. innominate v.
Aorta
Sup. vena cava
Pulmonary trunk
Upper lobe lung
R. atrium
R. and L. coronary vessels
Middle lobe lung
Lower lobe L. lung
R. ventricle

Your Body Cells

There are many special kinds of cells: muscle cells, brain cells nerve cells, bone cells, blood cells, skin cells.

The different cells do the work of different parts of your body. Muscle cells work together to make your arms and legs move. Your nerve cells carry messages to and from your brain. Can you think of other things cells do?

Cells need food and oxygen to do their work. The food you eat feeds your cells. Oxygen for your cells comes from the air you breathe.

How do food and oxygen get into the cells?

Your blood brings food and oxygen to your cells.

Before food can enter your bloodstream, it must be *digested*. Digested means that food is turned into liquid and made ready for the cells. Then it enters the bloodstream through the walls of the intestines. Food is carried in the bloodstream to all the body cells.

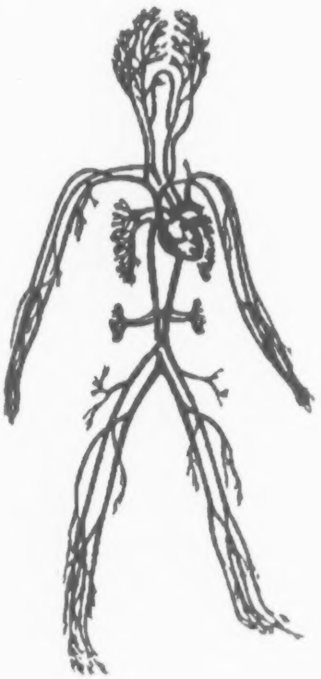
When you breathe, oxygen gets into the blood in your lungs. The oxygen is carried to the cells where it helps to burn or use up food. This gives you heat and energy.

When cells use up food and oxygen, some waste materials remain —just as ashes are left after a fire. These wastes are carried by the blood to parts of your body that can get rid of them. Carbon dioxide is a waste you breathe out through your lungs. Wastes collected in your kidneys pass out of your body in urine. When you perspire, your skin gets rid of some wastes. Parts of food not changed to liquid pass out through your bowels.

Your Bloodstream

How does blood get to every little cell?

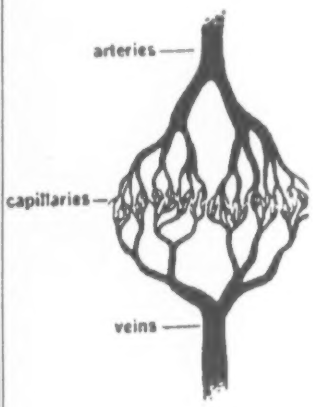
Blood flows through miles and miles of blood vessels in a never-ending stream. The blood vessels reach every part of your body. Blood vessels are hollow tubes, soft and elastic. They can stretch, or expand, to make room for the blood to flow through them. And they can squeeze, or contract, to help control the flow of blood.



The main kinds of blood vessels are *arteries, veins* and *capillaries*. Some of your arteries and veins are as big around as your thumb. Some are almost too small to see. Capillaries are the thinnest blood vessels of all. They are thinner than a single hair.

The blood flows from the big arteries into smaller ones which branch into arteries still smaller. From the smallest arteries the blood flows into the tiny capillaries. The capillaries connect the smallest arteries with the smallest veins.

The capillaries wind in and out along the cells. Capillaries have walls so thin that food and oxygen in the blood can pass through to the cells around them. That is how your cells are fed. At the same time, waste products in the cells pass into the capillaries and mix with the blood. That is how wastes are taken away from the cells by the blood.



The arteries carry food and oxygen to the cells. The veins take away the waste products. The capillaries are the bridges between the veins and the arteries.

In what way does the blood flow in the vessels?

Blood flows always in one direction—out of your heart into the largest arteries, into smaller and smaller arteries, into the capillaries, from the capillaries into the tiny veins, into larger and larger veins, and back into the heart.

Round and round your blood goes through your body, thousands of times a day. Blood never stops flowing. Every part of your body has it. You can prick your skin anywhere and draw some drops of blood.

Your Heart

What keeps blood flowing in a steady stream?

Your heart keeps blood flowing. Your heart is really a pump. It pumps the blood through your blood vessels. The beating of your heart is the sound it makes as it pumps.

How does blood flow in and out of the heart?

Inside your heart there are four rooms called *chambers*. A wall of muscle through the middle divides your heart into a *left side* and a *right side*. Each side has two chambers—an *upper chamber* and a *lower chamber*.

On each side of the heart, blood flows from the upper to the lower chamber. Little valves act as doors between the chambers. The valves open as blood flows from upper to lower chambers. Then the valves close to keep the blood from flowing back again.

Blood is always filling both sides of the heart. The blood that fills the left side comes from your lungs. It comes into your heart through big veins. This blood is bright red because it has just had a fresh supply of oxygen. Down it goes from the upper to the lower chamber. Then it is pumped out of your heart through a big artery. From the big arteries the red blood travels through smaller and smaller arteries on its way through your body.

Blood that fills the right side of your heart has just returned from a trip around your body. It has turned a dark, bluish color because it has given up oxygen to the cells. The bluish blood enters your heart through great veins and flows from the upper to the lower chamber. It is pumped out of your heart through an artery to your lungs.

In the lungs, the bluish blood takes on oxygen and gives up the waste gas, carbon dioxide. The fresh oxygen turns the blood bright red again. Now the blood is ready to return to the left side of your heart to be pumped out for another journey through your body.

As you can see, the bluish blood and the red blood do not mix. The wall dividing your heart keeps the blood separated. Valves in the heart and the blood vessels keep the blood flowing always in the same direction. The valves open to let blood through and snap shut to keep blood from flowing backwards. The heart valves are so strong that a doctor can hear them snap shut when listening to a person's heart. Lub-dub! Lub-dub!

How Fast Does the Heart Beat to Pump Blood?

In children the heart beats about 100 to 120 times a minute. In adults it beats about 70 to 90 times a minute. Usually small hearts beat faster than larger ones. This is true in animals too. An elephant's heart beats only 25 times a minute, but a mouse's heart beats 700 times a minute.

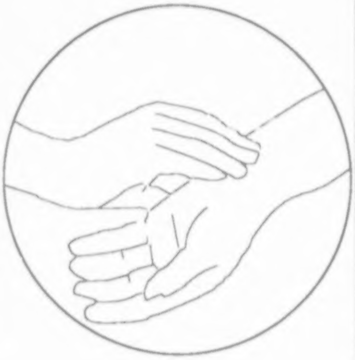
If you are excited or frightened, or if you have a fever your heart beats faster than usual. And when you exercise, it beats much faster. The cells of your muscles need extra food and oxygen when you exercise. So your heart must beat faster and work harder to bring more blood to your muscles.

Taking Your Pulse

You can count your own heart beats. You can feel them in your wrist. This is called taking your pulse. Place the first two fingers of your right hand on the inner side of your left wrist. The picture shows you how to do this.

Now you can feel an artery in your wrist give a little jump every time your heart beats. This is your pulse. The number of times your artery pulses a minute is your pulse rate. Your pulse rate is the same as your heart rate.

Would you like to know how fast your heart beats when you exercise? Run around the room a few times. Then take your pulse again. Notice how much faster your heart beats after you have been running! How many times a minute did your heart beat before you ran? How many times a minute afterwards?



Now you have learned some important things about your heart and your bloodstream. It took scientists many years to find out what you know. They are still studying the heart and making new discoveries about it all the time.

You will study about the heart and bloodstream again in higher grades, but if you want to learn more now, ask your teacher to tell you about some books you can read.

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